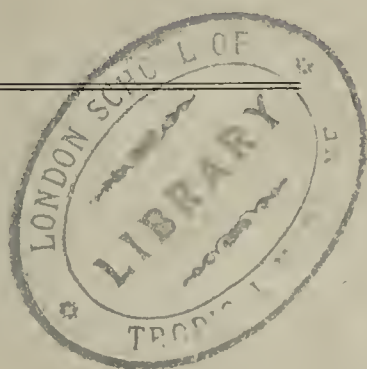


31 July 1913

NORTHERN NIGERIA.



ANNUAL MEDICAL REPORT

FOR YEAR ENDING

31ST DECEMBER, 1912.

PRINTED BY
WATERLOW & SONS LIMITED, LONDON WALL, LONDON.
1913.



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ZUNGERU,

NORTHERN NIGERIA,

10th March, 1913.

Sir,

I have the honour to submit, for the information of His Excellency the Governor, and for transmission to the Right Honourable the Secretary of State, the Medical Report on the health and sanitary condition of Northern Nigeria for the year 1912, together with the Returns, etc., appended thereto.

I have the honour to be, Sir,

Your obedient servant,

W. G. HALL,

Acting Principal Medical Officer.

THE CHIEF SECRETARY TO THE GOVERNMENT,

NORTHERN NIGERIA.



PROTECTORATE OF NORTHERN NIGERIA.

ANNUAL MEDICAL REPORT, 1912.

ADMINISTRATIVE.

STAFF.

A complete list of the Medical Staff and of the principal members of the Subordinate Staff is given in Table I.

The principal changes which occurred throughout the year are as follows :—

Dr. J. P. Fagan, Principal Medical Officer, retired on pension.

Dr. F. Manning, Deputy and Acting Principal Medical Officer, was invalided early in August, and remained on sick leave during the remainder of the year. During his absence the duties of Acting Principal Medical Officer were performed by Dr. M. Cameron Blair, Senior Sanitary Officer, and by Dr. W. Gordon Hall, Senior Medical Officer.

Dr. M. Cameron Blair attended the Conference of Principal Medical Officers, held at Lagos in November, in the dual capacity of Acting Principal Medical and Senior Sanitary Officer.

The following officers resigned their appointments :—Drs. B. Flood and P. C. Conran, and Mr. G. C. W. King, Chief Dispenser and Storekeeper.

Dr. E. W. Graham, Senior Medical Officer, was transferred to the Gold Coast.

Dr. A. Bremner was transferred to Sierra Leone.

Newly appointed officers of the West African Medical Staff included :—Drs. B. A. Percival, J. W. Thomson, R. Willan (from the Baro-Kano Railway Medical Staff), W. G. Cobb, W. B. Johnson, R. H. Nolan, L. Doudney, P. W. Black and J. E. L. Johnston.

FINANCIAL.

Table II. gives the expenditure for the year ending 31st December, 1912.

Revenue derived was as follows :—

	£	s.	d.
Hospital fees	727	8	4
Sale of medical comforts	104	10	3

PUBLIC HEALTH.

The health of Europeans may be regarded as fair. The death rate per 1,000 is above the average for the past two years, and the actual number of deaths is higher than that recorded for the five immediately preceding years. The invaliding rate per 1,000 is, on the contrary, an improvement.

I am able to present, for the first time, statistics bearing on the health of native officials, who are mainly drawn from West African Coast Colonies. Their health is generally good.

The health of the general native population was satisfactory. It should, however, be remembered that only a small percentage of the inhabitants come under the direct observation of Medical Officers, and the registration of deaths is as yet necessarily unreliable for statistical purposes.

Appended hereto are tables of analysis showing deaths and invalidings.

EUROPEANS.

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	Decennial Average.
Average popula- tion	309	322	342	347	424	499	544	637	641	703	476·80
Number of deaths	18	13	10	17	7	10	13	13	13	22	13·60
Death rate per 1,000 ...	58·25	40·37	20·23	48·00	16·50	20·04	23·80	20·41	20·28	31·29	29·81
Number of invalids	43	67	40	55	50	48	67	48	40	50	50·80
Invaliding rate per 1,000 ...	139·15	208·15	143·27	158·50	117·92	96·19	123·16	75·35	108·40	71·12	124·12

With regard to the figures for the year 1912, Tables VI. and VII. record a total of 13 deaths only, the result of Blackwater Fever, 3; Small Pox, 2; Malaria, 1; Diphtheria, 1; Pneumonia, 1; Empyema, 1; Ascites, 1; Peritonitis, 1; Sun Stroke, 1; Mercurial Poisoning (accidental), 1.

Nine deaths occurred of persons who, at the time of their decease, were unattended by medical men, or in cases where time and circumstances did not admit of their inclusion in the prescribed returns of sick. In these cases the cause of death was officially attributed as follows:—Blackwater Fever, 1; Malaria, 1; Dysentery, 1; Arterial Sclerosis, 1; Hyperpyrexia, 1; Pneumonia, 1; Gunshot Wound, 1; Siriasis, 1; and Multiple Injuries, 1.

Locality and climate, as will be observed, were prominent predisposing factors of at least twelve of the above fatalities.

The Senior Sanitary Officer, as heretofore, deals with diseases of the above nature, and reports fully on the measures taken to combat their spread.

Calling for special comment are two deaths in Europeans from Small Pox. As has been previously and frequently reported, this disease is endemic among the native community, and assumes a virulent form during each successive dry season in nearly every Province of the Protectorate. The two deaths occurred, the one in a lady missionary and the other in a trader; both of whose avocations necessitated their being in close contact with what was unsuspected infection. This danger is perhaps one that especially besets the trader in his handling of skins, cloths and similar native goods.

A total of 47 cases of Small Pox is shown in the nosological tables appended as having been under medical treatment. Such figures, however, cannot be regarded as representative of the cases that have actually occurred, a correct computation, under existing conditions, being impossible.

It is encouraging to note that the prejudice of the native against vaccination is gradually yielding. During the year 1911 the number of vaccinations

performed was 5,494 showing a percentage of 70·60 successes; whilst in 1912 the number amounted to 10,112 with 85 per cent. successful. This result may, I consider, be regarded as exceptionally good, more especially as each successful case reported is certified to by a medical officer, and it further enhances the previously expressed high opinion as to the efficacy of dried powdered lymph, which is now the only variety in use.

Blackwater Fever—the cause of four deaths—has already been dealt with in a special report. I attach a chart (A) showing the yearly incidence of cases and deaths in relation to cases of Malaria.

A comparative table for the past ten years is subjoined.

BLACKWATER FEVER.

	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	Decennial Average.
Number of cases ...	17	35	18	25	12	14	13	9	12	14	16·90
Rate per 1,000 of average Euro- pean population	54·00	108·69	52·63	72·04	28·32	22·05	23·89	14·18	18·72	19·90	41·44
Number of deaths	8	6	4	5	0	4	3	2	6	4	4
Case mortality per cent. ...	47·05	17·14	22·20	20·00	—	28·57	23·07	22·20	50·00	28·57	25·88

EUROPEAN OFFICIALS.

	1910	1911	1912
Average number resident ...	424	360	325
Total number on sick list ...	—	861	819
Total number of days on sick list ...	—	7,108	6,049
Average daily number on sick list ...	—	19·4	16·5
Percentage of sick to average number resident ...	—	233·3	252
Average number of days on sick list to each patient ...	—	8·25	7·39
Average sick time to each resident ...	—	19·2	18·6
Total number invalided ...	31	40	25
Percentage of invalidings to average number resident...	7·30	10·84	7·69
Total deaths ...	7	7	6
Percentage of deaths to average number resident ...	1·65	1·89	1·84

As was the case in the last annual report the officials of the Lagos (now Nigerian) Railway who were stationed in Northern Nigeria are not included in the above statistics. In future reports they will be so included.

The deaths of officials shown in the above table include one from Cerebral Sclerosis, which occurred on the River Niger as the deceased was on his way to England invalided.

One official met his death through drowning whilst on leave in England, and one died from some cardiac affection whilst on special duty in the Gold Coast Colony. These two deaths are not included in the table of analysis.

Twenty-five European officials were invalided as against forty in 1911. The causes of invaliding were mainly attributable, either directly or indirectly, to climatic conditions. Nervous affections necessitated invaliding in six instances, the diagnoses being Melancholia two, and Neurasthenia four.

NATIVE OFFICIALS.

										1912.
Average number resident	...	...	...	...	...	...	...	...	...	621
Total number on sick list	...	...	...	...	...	...	...	...	...	574
Total number of days on sick list	...	...	...	...	...	...	...	...	...	3,265
Percentage of sick to average number resident...	...	...	...	...	...	...	...	...	...	92.43
Average number of days on sick list for each patient	...	...	...	...	...	...	...	...	...	5.68
Average sick time to each resident	...	...	...	...	...	...	...	...	...	5.25
Total number of invalids	...	...	...	...	...	...	...	...	...	4
Percentage of invaliding to average number resident	...	...	...	...	...	...	...	...	...	0.64
Total deaths	...	...	...	...	...	...	...	...	...	2
Percentage of deaths to average number resident	...	...	...	...	...	...	...	...	...	0.32
Average daily number on sick list	...	...	...	...	...	...	...	...	...	8.92

The above table, given for the first time, is consequently incapable of comparison with previous figures as regards native officials serving in the Protectorate.

By a coincidence the figures given correspond closely with the table respecting native officials serving in the Colony of Sierra Leone for the year 1911.

As I have already stated I consider the health of this class of official to have been generally good. The percentage of invalidings and deaths being most satisfactory.

GENERAL EUROPEAN POPULATION.

As will have been observed the number of resident Europeans is gradually increasing. The population may be divided as follows :—

Government Officials	...	325
Trading Companies	...	93
Mining Industries	...	250
Missionaries	...	35
		—
		703
		==

Of whom about 20 were females.

With regard to the difficulty reported last year of obtaining accurate health statistics concerning mining communities, the matter has now been taken in hand by the Administration, and the institution of a system of returns of sickness will enable a close observation to be kept over the health of this rapidly increasing class of individuals.

GENERAL NATIVE POPULATION.

The official estimate is the same for 1912 as was given the previous year, viz., 9,269,000.

The absence of figures regarding births and deaths, which are as yet unobtainable, renders comment under this heading impossible.

SANITATION.

The report of the Senior Sanitary Officer deals thoroughly with this important subject in the manner prescribed in the model report, in so far as it is applicable to local conditions.

The numerous conferences held, in association with political officers, with the native administrators regarding sanitation measures cannot fail to prove of great future value.

The "town planning" which is now invariably carried out under the advice of medical and sanitary officers, must be also looked upon as an advance in the desired direction. Much, however, yet remains to be accomplished before any perceptible statistical improvement is manifest.

In connection with the observations of the Senior Sanitary Officer relative to the high incidence of Malarial diseases among European employees of trading firms at Lokoja, it would appear, in the interests of public health generally, to call upon the increasing number of traders who are now establishing themselves in the country to bear in mind the danger of European dwellings insufficiently separate from native communities. The subject is, I realise, no new one, and the difficulty of trading establishments being suitably segregated is, in many instances, almost insurmountable; but that it constitutes a real danger cannot be gainsaid.

The question of the water supply at Minna and Kano is an important one, but it is receiving full attention at the hands of the proper authorities, and it is hoped that the difficulties in connection therewith may prove capable of solution in the near future.

I regret to report that the quality of the water in the River Dago, from which the water supply for the station at Zungeru is drawn, is gradually deteriorating; this is due to the presence of gangs of workmen living along the line between Zungeru and Minna, the line passing through the watershed of the Dago. Efforts are being made to combat this evil, but a certain amount of pollution is inevitable. Before the construction of the railway this stretch of country was practically uninhabited.

In consequence of this pollution it became necessary during the year to begin a daily issue of condensed water to all Government clerks employed at Zungeru.

During the year 17 convictions were recorded at Lokoja and five at Zungeru for contravention of the Cantonment Sanitary Regulations.

I may here mention that I am quite in accord with the Senior Sanitary Officer that the accelerated railway service to Lagos has proved itself of benefit to many invalids, but the present method of embarkation at that port is far from satisfactory for sick men, and in at least one instance, the patient had to be sent down the River Niger to Burutu so as to avoid the surf boat experience which has to be faced at Lagos.

METEOROLOGY.

Table V. gives detailed monthly returns under this heading from the usual stations.

Figures of interest were, briefly :—

	Reading.	Date.	Station.
Highest shade temperature	115°	April and May	Geidam, Kontagora, Katagum
Lowest shade temperature	41	December	Kano
Highest mean temperature	85.3	"	Baro
Lowest mean temperature	74.1	"	Naraguta
Maximum Rainfall (annual)	47.80"	"	Ankpa
Minimum Rainfall (annual)	12.59"	"	Geidam
Maximum rainfall on one day	4.62"	20th August	Ankpa
Greatest range of temperature	71°	"	Geidam

The amount of rainfall throughout the Protectorate was generally small—in some northern stations exceptionally so. I attach Charts (B and C) from which will be seen at a glance the variation in rainfall for the past ten years at Lokoja and Zungeru; and for the past five years at Sokoto, Yola, Ilorin and Kano. My reason for selecting the above stations is that the two former have hitherto been regarded as the most important centres, whilst the latter four are given because of their widely separate geographical situations.

I also attach a Chart (D) showing the admissions to the sick list of Europeans for the past four years by months which would appear to point to the fact that no season of the year can be definitely singled out as being more predisposing to sickness than another.

HOSPITALS AND DISPENSARIES.

The European Hospital at Baro, originally instituted for the reception of patients employed in connection with railway construction, was closed in August. Baro itself has become, at any rate temporarily, but a comparatively small European centre. The facilities afforded by the railway for the transport of sick have rendered Zungeru Hospital more easy of access from the northern stations than Baro Hospital; so much so that the numbers of sick treated in the latter institution failed to justify the expense of its maintenance.

The hospital at Zungeru thus became the only one to accommodate European sick from Ilorin, Zungeru, Minna, Zaria, Kano and the mining districts. At no time during the year was the accommodation overtaxed, but the need for another hospital situated centrally to the now populous and increasing stations of Zaria, Kano and the tin fields became obvious.

Tentative plans for the erection of such a hospital at Zaria were prepared, but it was eventually decided to postpone building until more definite decisions had been arrived at concerning the future size, and situation, of what would be headquarters.

Towards the close of the year the military stationed in Zungeru were, with the exception of one Company, moved to a temporary site at Kaduna, thus creating a new station. During the coming twelve months a careful observation will be kept on this site from a health and meteorological point of view.

Recognising the necessity of extra provision, the Administration have now decided upon the appropriation of two houses at Kaduna as a temporary European Hospital. Kaduna is fully described by the Senior Sanitary Officer in his report annexed hereto.

In spite of the decreasing numbers of Europeans passing through, the number of admissions to Lokoja Hospital shows but a slightly smaller total than that of previous years.

The two hospitals for Europeans continue to be efficiently staffed and administered. The nosological tables show a detailed account of admissions.

It will be noted that during the year there were two cases of Enteric Fever treated; both recovered and were invalided. One—a P.W.D. Foreman—developed at Kano after seven months residence in the country; the other—a Corporal on the Boundary Commission—with six weeks. None of the other diseases of Europeans appear to merit special comment.

NATIVE HOSPITALS.

The established hospitals at Zungeru and Lokoja have hitherto been regarded as the only institutions of that nature for statistical purposes.

Government buildings are, and have been for some years, provided for the reception of sick natives at several stations, the numbers treated therein have been included under the heading of out-patients.

In the present report under Table VI., I have included the Baro Native Hospital, and in future it will be possible to add still further to this list.

Arrangements are now in hand for the building of new permanent hospitals for natives at Minna, Zaria, and Kano. Sites are being carefully selected, and the buildings are to be constructed with due regard to local requirements.

The totals of admissions to the three above-mentioned hospitals exceed by 50 only those for 1911.

The admissions for Malaria show a decided increase over last year. I am, however, quite in concord with the Senior Sanitary Officer that this number does not mean that the disease itself is increasing, but, on the contrary, is a pleasing demonstration that our hospitals are gradually gaining the confidence of the native.

Another cause for congratulation is the steadily growing willingness of the native to submit himself to surgical treatment.

Operative surgery is now looked upon by the Medical Officers in charge of the hospitals under reference, as forming an almost daily portion of their duties, whereas a short two or three years ago an operation was a comparatively rare event. I attach to the nosological table an operation table of the Native Hospital, Zungeru, from May to December. It is worthy of note that spinal anæsthetics were, for the first time, introduced during the past year.

It should not, however, be thought that the practice of surgery is solely confined to the larger stations; as an instance to the contrary, I may mention that in our most recently occupied station an operation for Strangulated Hernia was performed within a few days of the Medical Officer's arrival, the result being quite satisfactory.

Special attention is being directed to the housing of sick prisoners in the Government gaols. During the year a new prison hospital was opened at Lokoja and, at the time of writing, additional hospital accommodation is being provided at Zungeru for prisoners.

It may be well to reiterate that native sick are, when necessary, subsisted at the Government expense, provided with suitable bedding, and a free issue is made to them of whatever medical comforts are deemed necessary.

OUT-PATIENTS (EUROPEANS).

The number of admissions under this heading was 958, many of whom would no doubt have been admitted to hospital had one been accessible. This shows an increase of 283 over the total for 1911.

Among the noticeable increases is Malaria, 101 cases. A growing European population, composed mainly of trading and mining employees, many of them necessarily living under unfavourable conditions in regard to sites and dwellings, brings with it, as a matter of course, an increasing number of Malarial admissions. The Senior Sanitary Officer deals with Anti-Malarial measures that are being actively employed, and I do not consider the figures regarding Malaria lead to misgiving for the future.

OUT-PATIENTS (NATIVES).

It will be noted that in the nosological table of the present report the infective and general diseases are given as hitherto, but the systematic diseases are detailed, and not given in one total under their respective headings.

The model, on which my report is based, leaves this matter to the discretion of the reporting officer, but there are, in my opinion, many items of interest which are overlooked if the diseases under the various headings are recorded collectively; hence my reason for the alteration.

The number of admissions show a decrease compared with last year. The reason for this may probably be attributed to the fact that fewer natives have in the past twelve months been in direct Government employment (*e.g.*, railway construction, etc.); because it was from this section of the community that many sick were drawn. It is not meant to imply that their disabilities were to any appreciable extent caused through the nature of their employment, but being in constant contact with Europeans, and frequent medical inspections, brought to light many ailments which in the ordinary course would have been unnoticed. Again much labour has been attracted to the centres of the mining industries; the natives there employed receive medical attention at the hands of the medical men employed under the Chamber of Mines, but statistics concerning these employees are not available.

Under Leprosy it will be observed that 744 admissions are recorded, as against 83 in 1911. The 744 cases include the numbers segregated in the leper camps at Maiduguri, Geidam and Sokoto, and are not, as it appears at sight, indicative of a great increase.

This number has been included as it seems desirable to observe from year to year the progress of isolation of those affected by the malady, more especially as reports from the district Medical Officers point to there still being numerous cases which it has not yet been possible to segregate. Efforts in this direction are, however, being made by the Native Administrations, and the outlook is a decidedly hopeful one.

The leper camps are very highly spoken of by the Medical Officers charged with their supervision; they are admirably laid out with broad intersecting thoroughfares, and are kept in a thoroughly sanitary condition. The inmates of these camps are well fed, suitably clothed and generally contented. No general course of treatment is adopted.

SLEEPING SICKNESS.

Endemic in certain districts, this disease is dealt with by the Senior Sanitary Officer, and needs little further comment.

The Sleeping Sickness Camp at Zaria, which was opened in January, 1911, for the reception of patients, now contains four inmates, two deaths having occurred during the year.

Pursuing the policy of local as opposed to central segregation of cases of this disease, efforts are not made generally to obtain admissions to the camp at Zaria, but it remains open for the reception of such as voluntarily seek admission.

A camp has also been established at Wukari, near Ibi, for the reception of local cases.

PYREXIA OF UNCERTAIN ORIGIN.

This diagnosis was returned in 148 instances of native out-patients, and I quite concur with the Senior Sanitary Officer in his remarks regarding these cases. It should also be remembered that a more definite determination is in many cases specially difficult, as numbers of natives will present themselves as out-patients for two or three days and then attend no more, probably before the appearance of symptoms of any positive nature.

PNEUMONIA.

The tables of sickness from Pneumonia bear out the Senior Sanitary Officer's observations concerning this dangerous malady. Combining the extern and intern patients 84 cases were admitted, of whom 27 died—a percentage of 32·14.

VENEREAL DISEASES.

The figures are slightly in advance of last year. I am of opinion that through the aid of the repeated efforts of the Medical and Sanitary Officers, who are continually pointing out to the native community simple measures for the prevention of such diseases, that a diminution in the incidence may be anticipated in the near future.

PARASITIC DISEASES.

The detailing of each disease of this class is of special interest, as collective figures give somewhat misleading impressions regarding the more commonly met affections; many of an endemic nature.

SCIENTIFIC.

Full advantage continues to be taken by Medical Officers of the facilities afforded them for taking out entomological and other courses during their leave.

An exhaustive mosquito survey was made of the Cantonment at Zungeru during the year, and an article on Trypanosomiasis in Domestic Animals, by Dr. J. W. Scott Macfie, is shortly to be published, by permission of His Excellency the Governor, in the Annals of the Liverpool School of Tropical Medicine.

Specimens are from time to time submitted to the various scientific institutions. Tsetse flies are collected and identified whenever possible, and a close observation is maintained over breeding localities of *Stegomyia* and other species of mosquito.

W. GORDON HALL,

Acting Principal Medical Officer.

ZUNGERU,

NORTHERN NIGERIA.

10th March, 1913.

TABLE I.

The following is a complete list of the staff employed.

Office.	Name.	Remarks.
Principal Medical Officer ...	Fagan, J. P. ...	To pension 8th Oct., 1912.
Deputy Principal Medical Officer ...	Manning, F. ...	
Senior Sanitary Officer ...	Blair, M. C. ...	
Senior Medical Officer ...	Graham, E. W. ...	Transferred to Gold Coast.
" " " ...	Watson, C. F. ...	
" " " ...	Gordon-Hall, W. H. A. ...	
" " " ...	Taylor, W. I. ...	Appointed 21st August, 1912.
Junior Sanitary Officer ...	Foy, H. A. ...	
Medical Officer ...	Chesnaye, F. W. ...	{ Seconded with Anglo-German Boundary Commission, 15th August, 1912.
" " ...	Lobb, H. P. ...	
" " ...	Adams, E. C. ...	
" " ...	Flood, B. ...	Resigned 19th May, 1912.
" " ...	Manuk, M. W. ...	
" " ...	Bremner, A. ...	To Sierra Leone, 3rd January, [1912.
" " ...	Twomey, G. R. ...	
" " ...	Parsons, A. C. ...	
" " ...	Ellis, M. F. ...	
" " ...	Costello, C. T. ...	
" " ...	McKinney, H. G. ...	
" " ...	McGahey, K. ...	
" " ...	Norman, G. B. ...	
" " ...	Dalziel, J. Mc. E. ...	
" " ...	Williams, R. F. ...	
" " ...	Inness, W. J. D. ...	
" " ...	Swann, A. J. T. ...	
" " ...	Pirie, G. J. ...	
" " ...	Moiser, B. ...	
" " ...	McLeay, C. W. ...	
" " ...	Pollard, J. Mc. F. W. ...	
" " ...	Trumper, W. A. ...	
" " ...	Bissell, F. E. ...	
" " ...	McCay, F. W. ...	
" " ...	Porteous, E. J. ...	
" " ...	Lindsay, J. ...	
" " ...	Macfie, J. W. S. ...	
" " ...	Morrison, W. ...	
" " ...	Conran, P. C. ...	To Nyasaland, 2nd February, [1912.
" " ...	Jeffreys, H. C. ...	
" " ...	Crichton, A. J. M. ...	
" " ...	Davies, L. W. ...	
" " ...	Courtney, B. J. ...	
" " ...	Percival, B. A. ...	Appointed 10th January, 1912.
" " ...	Thomson, J. W. ...	Do. do. do.
" " ...	Willan, R. ...	Do. do. do.
" " ...	Cobb, W. G. ...	Do. 24th April, 1912.
" " ...	Johnsen, W. B. ...	Do. do. do.
" " ...	Nolan, R. H. ...	Do. do. do.
" " ...	Doudney, L. ...	Do. 8th May, 1912.
" " ...	Black, P. W. ...	Do. 29th do.
" " ...	Johnston, J. E. L. ...	Do. 30th October, 1912.
Chief Dispenser and Storekeeper ...	King, G. C. W. ...	Resigned 30th April, 1912.
Male Nurse ...	Vincent, J. W. ...	
One Staff Sergeant and Nine Sergeants ...	Non-Commissioned Officers, R.A.M.C., employed ...	
13 Nurses ...	Ward, Miss M. A. ...	
	Clark, Miss J. A., and others.	
2 Dispensers, Class ii. ...	Roberts, C. E. ...	
	Nicol, J. J. ...	
1 Dispenser, Class iii. ...	Coker, S. J. ...	
1 Clerk, Grade ii. ...	Eshun, J. F. ...	
2 Clerks, Grade iii. ...	Buckle, S. M. ...	
	Sam, F. M. ...	
15 Dressers ...		
3 Headmen of Ambulance ...		
36 Ambulance Bearers ...		
18 Dispensary Attendants ...		
2 Messengers ...		
3 Cooks ...		
11 Ward Servants ...		

TABLE II.

EXPENDITURE.

MEDICAL.

	£	s.	d.
Personal Emoluments	28,532	0	0
Drugs, Instruments and Appliances	1,367	6	7
Hospital and Camp Equipment	158	4	11
Medical Comforts	84	2	9
Hospital Diet and Provisions	528	4	10
Light, Fuel, etc.	43	8	6
Horse Allowance	1,366	19	6
Outfits for N.C.O.'s, R.A.M.C.	116	11	6
„ „ Nursing Sisters	108	0	0
„ „ Medical Officers	108	0	0
Contribution to South. Nigeria for Medical Officers at Burutu	50	0	0
Medical Examination of Officers in England	263	11	0
Expenses of N.C.O.'s and Nurses travelling in England ...	51	3	2
Scientific Instruments and Appliances	43	14	4
Expenses of Medical Officers and Nurses at Tropical School and fees on engagement of Nurses	698	11	7
Refund to Medical Officers of fees for courses of study for promotion	226	16	4
Expenses in connection with Isolation Hospitals	105	19	5
Vaccination expenses	343	17	8
Expenses in connection with Research Work	1	4	0
Extra Medical Assistance	17	15	0
Fees to Medical Officers for Post-mortems	99	15	0
Expenses in connection with segregation of Lepers	120	0	0
Share of expenditure Advisory Medical and Sanitary Com- mittee	66	13	4
Total	£34,501	19	5

SANITATION.

	£	s.	d.
Personal Emoluments	2,021	12	0
Horse Allowance	74	17	6
Kerosene and Disinfectants	137	8	11
Laboratory Equipment and Upkeep	8	14	5
Sanitary Labourers at Out-Stations	257	0	6
Sanitary Labourers for Burutu Beach	126	18	8
Total	£2,626	12	0

TABLE V.

METEOROLOGICAL RETURN FOR THE YEAR 1912.

ZUNGERU.								LOKOJA.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	98	60	38	80.7	—	39	N.E.	96	57	39	80.1	.07	67	N.E.
February ...	102	55	47	82.8	—	36	"	98	64	34	83.6	1.18	63	"
March ...	105	67	38	88.2	—	42	"	101	65	36	85.8	1.14	59	S.W.
April ...	107	69	38	93.1	.56	62	S.W.	100	69	31	84.9	5.46	66	"
May ...	102	70	32	87.4	.98	68	"	98	70	28	84.1	3.59	70	"
June ...	95	67	28	81.3	6.25	74	"	92	68	24	80.0	5.02	75	S.S.W.
July ...	94	68	26	79.3	5.12	81	"	91	68	23	79.5	4.96	75	"
August ...	91	66	25	79.5	6.81	82	"	90	68	22	78.8	9.48	76	S.W.
September ...	90	66	24	77.5	8.81	80	S.S.W.	89	67	22	77.9	10.29	77	"
October ...	95	63	32	80.7	1.40	77	S.	92	65	27	80.3	5.14	73	"
November ...	98	56	42	79.0	—	62	S.	95	62	33	81.0	.41	67	"
December ...	99	56	43	78.5	—	47	N.E.	95	58	37	77.9	—	63	N.E.
Year ...	107	56	51	82.3	29.93	62	S.W.	101	57	44	81.1	46.74	69	S.W.

KANO.								YOLA.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	94	45	49	68.6	—	34	E.	98	61	37	79.5	—	40	N.E.
February ...	99	43	56	70.1	—	24	"	100	63	37	83.7	—	55	"
March ...	108	50	58	77.3	—	23	"	107	67	40	88.9	—	54	N.W.
April ...	111	52	59	86.6	1.30	39	W.S.W.	107	75	32	91.6	.39	60	W.
May ...	109	63	46	87.3	.32	36	S.W.	106	71	35	90.1	1.64	65	N.W.
June ...	103	68	35	84.4	2.01	55	"	99	69	30	82.1	6.18	74	W.
July ...	99	63	36	79.4	4.91	68	"	92	65	27	79.5	7.66	80	N.W.
August ...	92	63	29	76.5	12.49	78	"	93	66	16	79.5	10.78	79	"
September ...	92	65	27	79.1	7.93	75	"	90	69	21	78.9	9.71	73	"
October ...	99	53	46	79.0	.24	51	"	96	71	25	83.0	2.57	73	"
November ...	98	46	52	75.3	—	32	N.E.	98	64	34	82.5	—	57	W.
December ...	95	41	54	66.6	—	34	"	98	60	35	79.4	—	53	N.W.
Year ...	111	41	70	77.5	29.20	46	S.W.	107	60	47	83.2	38.93	63	N.W.

METEOROLOGICAL RETURN FOR THE YEAR 1912—*continued.*

KEFFI AND WOMBA.								NAFADA.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	99	56	43	78.8	—	62	E.	100	42	58	71.4	—	29	N.E.
February ...	99	59	40	80.4	.50	54	N.E.	101	49	52	78.5	—	26	"
March ...	103	56	47	81.9	.24	43	"	111	56	55	82.3	—	22	"
April ...	104	65	39	82.8	4.40	67	W.	112	60	52	91.8	.02	34	S.W.
May ...	No records owing to				change of		station.	111	69	42	91.0	—	33	N.E.
June ...								110	68	42	86.8	3.61	61	S.W.
July ...	90	63	37	77.7	4.73	79	N.W.	97	67	30	83.0	5.45	66	"
August ...	86	68	18	76.3	13.40	84	W.	95	68	27	80.8	5.47	75	"
September ...	87	66	21	73.5	11.46	84	"	96	67	29	80.3	5.39	70	"
October ...	95	66	29	79.9	1.13	71	S.W.	101	56	45	80.5	2.07	46	N.E.
November ...	95	57	38	81.6	.09	45	W.	103	47	56	76.4	—	27	"
December ...	96	53	43	76.2	—	35	"	101	44	57	71.6	—	28	"
Year ...	104	53	51	78.1	—	62	W.	112	42	70	81.3	22.01	43	N.E.

BARO.								BIRNIN-KEBBI.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	100	64	36	83.3	—	56	S.W.	94	49	45	73.8	—	33	N.E.
February ...	105	69	36	87.6	—	48	S.W. & N.W.	102	54	48	78.4	—	25	"
March ...	109	70	39	90.3	.10	45	S.W.	109	58	51	80.1	—	30	"
April ...	108	70	38	88.1	4.52	62	"	111	67	44	92.4	—	46	S.W.
May ...	104	68	36	87.1	4.24	67	"	111	73	38	91.9	.80	50	"
June ...	102	68	34	83.1	5.0	74	N.E.	104	69	35	86.4	1.79	66	"
July ...	98	68	30	82.0	5.34	77	S.W.	99	68	31	81.8	5.32	79	"
August ...	95	68	27	80.7	11.04	79	"	96	68	28	80.5	6.25	83	"
September ...	94	69	25	79.6	9.42	83	"	95	67	28	84.3	4.36	82	"
October ...	100	71	29	83.8	3.60	73	"	98	63	35	81.9	1.80	74	"
November ...	100	66	34	84.4	.25	65	"	99	56	43	78.3	—	43	N.E.
December ...	98	61	37	84.5	—	58	"	88	56	35	72.1	—	36	"
Year ...	109	61	48	85.3	43.51	66	S.W.	111	49	62	81.8	20.32	53	S.W.

METEOROLOGICAL RETURN FOR THE YEAR 1912—*continued.*

BAUCHI.								ILORIN.							
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.	
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		
January ...	94	55	39	74.3	—	32	N.N.E.	98	60	38	80.6	.49	68	S.W.	
February ...	96	56	40	74.8	—	29	„	101	60	41	83.6	—	62	„	
March ...	104	52	52	80.1	—	26	N.E.	102	63	39	84.9	.64	63	„	
April ...	104	68	36	87.5	.81	45	S. & N.E.	100	68	32	83.4	7.29	72	„	
May ...	103	69	34	87.6	2.06	46	N.E.	101	67	34	83.0	4.08	78	„	
June ...	98				4.86	67	S.W.	95	65	30	80.0	5.87	74	„	
July ...	93				9.01	70	„	90	64	26	77.4	2.77	81	„	
August ...	91	Thermometers				12.29	80	„	90	68	22	77.8	2.99	78	„
September ...	91		out of		6.15	77	„	87	67	20	74.9	8.74	84	„	
October ...	95		Order.		.65	49	N.E.	92	67	25	79.0	3.75	74	„	
November ...	95				—	27	„	95	58	37	77.6	2.23	77	„	
December ...	94				—	31	„	94	52	42	76.4	—	56	N.E.	
Year ...	104	52	52	80.8	35.83	48	N.E.	102	52	50	79.9	38.85	72	S.W.	

GEIDAM.								MAIDUGARI.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	103	44	59	71.6	—	31	N.E.	99	47	52	71.7	—	33	N.E.
February ...	104	48	56	74.9	—	27	"	100	52	48	76.1	—	29	"
March ...	111	57	54	81.8	—	23	"	111	57	54	82.7	—	25	E.
April ...	115	62	53	92.8	—	29	S.W.	114	65	49	93.6	—	47	S.W.
May ...	115	69	46	92.8	.09	29	N.E.	111	71	40	92.5	—	56	"
June ...	113	70	43	91.5	2.96	50	S.W.	110	71	39	89.9	1.45	64	N.E.
July ...	106	71	35	89.0	1.10	55	"	101	70	31	85.5	3.43	72	S.W.
August ...	100	63	37	82.2	5.48	67	W. & S.W.	98	68	30	81.2	6.03	83	"
September ...	104	68	36	85.1	2.55	60	W.	98	67	31	81.0	3.45	73	"
October ...	107	63	44	86.0	.41	35	E.	103	63	40	83.6	1.02	45	E.
November ...	104	55	49	80.0	—	28	N.E.	104	54	50	79.3	—	44	E.N.E.
December ...	96	46	50	72.4	—	35	E.	95	44	51	71.0	—	37	E.
Year ...	115	44	71	83.3	12.59	38	N.E.	114	44	70	82.3	18.38	50	E. & N.E.

METEOROLOGICAL RETURN FOR THE YEAR 1912—*continued.*

ZARIA.								KONTAGORA.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	99	46	53	72.6	—	31	N.E.	99	55	44	78.9	—	26	S.E. & N.E.
February ...	100	51	49	75.3	—	29	„	103	56	47	81.0	—	24	N.E.
March ...	106	56	50	80.2	—	32	„	106	65	41	87.4	—	32	„
April ...	107	59	48	84.3	3.59	47	S.W.	115	65	50	91.5	.77	58	S.W.
May ...	106	60	46	82.5	1.83	50	„	109	69	40	90.5	.38	53	„
June ...	99	54	45	75.9	3.93	89	„	100	67	33	82.5	5.16	67	„
July ...	95	50	45	74.6	8.08	72	„	94	69	25	80.6	3.51	73	„
August ...	93	53	40	72.4	9.71	78	„	92	68	24	78.9	7.46	79	„
September ...	92	54	38	74.8	11.36	76	„	93	65	28	78.0	11.83	80	„
October ...	99	51	48	75.5	3.63	62	„	95	59	36	80.6	3.72	67	„
November ...	97	50	47	73.2	—	37	N.E.	99	53	46	78.3	—	39	N.E.
December ...	95	47	48	68.9	—	36	„	99	54	45	78.5	—	28	„
Year ...	107	46	61	75	43.13	53	S.W.	115	53	62	82.2	32.83	52	S.W.

KATAGUM.								SOKOTO.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	97	46	51	71.8	—	30	N.E.	92	55	37	73.5	—	40	N.E.
February ...	102	48	54	75.8	—	25	„	95	59	36	78.0	—	28	„
March ...	112	57	55	82.7	—	23	„	102	63	39	82.9	—	28	„
April ...	113	63	50	92.6	—	35	W.	106	70	36	92.8	.09	35	S.W.
May ...	115	67	48	92.5	.10	28	E.	106	75	28	92.3	.16	35	„
June ...	110	68	42	88.7	.82	48	W.	102	73	29	87.0	2.76	56	„
July ...	102	68	34	84.7	4.21	64	S.W.	97	69	28	82.5	5.02	65	„
August ...	97	67	30	81.0	11.66	78	„	91	70	21	79.7	7.62	72	„
September ...	97	68	29	83.2	2.86	70	„	92	70	22	80.2	3.46	67	„
October ...	104	57	47	81.1	.65	53	E.	96	66	30	81.7	.05	50	N.E. & S.W.
November ...	103	54	49	77.7	—	38	E. & N.E.	95	61	34	79.0	—	29	N.E.
December ...	97	45	52	70.5	—	46	N.E.	91	56	35	73.3	—	30	„
Year ...	115	45	70	80.8	20.50	44	N.E.	106	55	51	81.9	19.16	44	S.W.

METEOROLOGICAL RETURN FOR THE YEAR 1912—*continued.*

IBI.								ANKPA.						
MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	102	53	49	80.7	—	41	N.E.	92	52	40	77.2	2.40	76	S.E.
February ...	105	57	48	84.1	—	40	"	94	62	32	81.6	—	71	"
March ...	108	66	42	88.7	—	48	"	96	62	34	81.4	2.95	69	S.W.
April ...	109	69	40	87.7	1.68	65	S.W.	96	68	28	80.8	5.92	76	"
May ...	100	68	32	84.5	4.28	73	"	93	68	25	80.5	2.75	78	"
June ...	92	66	26	78.9	12.27	82	"	90	65	25	76.5	7.70	83	"
July ...	88	66	22	78.3	6.36	83	"	84	66	18	75.5	3.09	86	"
August ...	89	69	20	78.7	4.29	83	"	84	65	19	75.1	8.14	86	"
September ...	90	67	23	77.9	15.72	89	"	84	66	18	74.8	10.82	87	"
October ...	94	68	26	80.7	1.50	80	"	88	66	22	76.6	3.98	87	"
November ...	96	57	39	80.5	—	71	"	88	61	27	77.0	.06	81	"
December ...	97	58	39	77.5	—	45	N.E.	74	64	30	79.1	—	56	N.E.
Year ...	109	53	56	81.5	46.10	66	S.W.	96	52	44	79.6	47.81	79	S.W.

NARAGUTA.

MONTH								TEMPERATURE.				RAINFALL.		WIND.
								Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	...	...	...	...	...	...	...	90	51	39	71.6	—	26	E.
February ...	...	...	...	...	...	...	...	92	55	37	74.2	—	27	"
March ...	...	...	...	...	...	...	...	98	62	36	78.6	5.35	53	S.W.
April ...	...	...	...	...	...	...	...	97	61	36	82.6	.37	31	E.
May ...	...	...	...	...	...	...	...	95	63	32	79.0	.97	47	N.E.
June ...	...	...	...	...	...	...	...	88	59	29	73.7	8.00	65	S.W.
July ...	...	...	...	...	...	...	...	87	60	27	72.1	10.71	66	"
August ...	...	...	...	...	...	...	...	87	60	27	70.6	11.70	72	"
September ...	...	...	...	...	...	...	...	89	59	30	71.9	9.45	64	S.E.
October ...	...	...	...	...	...	...	...	89	54	35	73.3	.78	44	N.E.
November ...	...	...	...	...	...	...	...	91	54	37	73.5	—	29	"
December ...	...	...	...	...	...	...	...	92	46	38	68.6	—	30	"
Year ...	...	...	...	...	...	...	...	98	46	52	74.1	47.33	46	Various.

TABLE VI.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1912.

DISEASES.	HOSPITAL AT ZUNGERU.										HOSPITAL AT LOKOJA.										HOSPITAL AT BARO.										TOTAL.																																																																																																																																																																																																																																																																																																																											
	EUROPEANS.					NATIVES.					EUROPEANS.					NATIVES.					EUROPEANS.					NATIVES.					EUROPEANS.					NATIVES.																																																																																																																																																																																																																																																																																																																						
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	Admissions.	Deaths.	Invalids.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	Deaths.	Total Cases Treated.	Remained end of 1911.	Admissions.	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RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1912—continued.

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RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1912—*continued.*

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DISEASES.	HOSPITAL AT ZUNGERU.										HOSPITAL AT LOKOJA.										HOSPITAL AT BARO.										TOTAL.																																																																																																																																																																																																																																																																																																																																																							
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RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1912—continued.

[illegible]

OPERATION TABLE.

NATIVE HOSPITAL, ZUNGERU—MAY TO DECEMBER, 1912.

DISEASE.	OPERATION.	HEALING		Cured.	Died.	Total.	REMARKS.	
		Per Prim. & a.	Suppurat- ing.					
A—DIGESTIVE SYSTEM.								
(1) Reducible inguinal her- nia.	Foster's radical cure...	5	...	5	...	5	Congenital Sac, 4; acquired, 1.	
(2) Strangulated inguinal hernia.	Herniotomy and radical cure	1	...	1	...	1		
(3) Hæmorrhoids ...	Ligature and removal. Com- plete Whitehead opn. ...	...	...	1	...	1	Moribund case, improved after operation, but peritoncum contaminated from wound and death on 8th day with peritonitis.
(4) Dysentery ...	Cæcostomy and lavage	...	...	3	...	3	
	Appendicostomy and lavage	3	...	1	3	4		
							All moribund cases with gan- grenous type of dysentery. Recovered completely, 1; died in two days from inan- ition, dysenteric ulcers healing, 1; died on 6th day from perforation of a dysen- teric ulcer, 1; died 6 weeks later from inanition, all ulcers healed, but got a mass of scar tissue, 1.	
B—GENITO-URINARY SYSTEM.								
(1) Phimosis ...	Circumcision ...	14	...	14	...	14		
(2) Hydrocele of Tunica- Vaginalis	{ Inversion of sac ...	1	1	2	...	2		
	{ Excision of sac ...	3	...	3	...	3		
(3) Cyst of Epididymis ...	Excision ...	1	...	1	...	1		
(4) Stricture of Urethra with retention of Urine.	Passage of Gouley guides and sounds.	...	...	2	...	2	
(5) Spasmodic Dysme- norrhœa	Dilatation of cervix uteri ...	...	...	1	...	1	
(6) Endometritis ...	Dilatation and curetting uterus.	...	...	1	...	1	
C—RESPIRATORY SYSTEM.								
(1) Pyo-pneumothorax ...	Thorotomy and drainage ..	...	...	...	1	1	
D—OCULAR DISEASES.								
(1) Pterygium ...	Excision ...	...	...	2	...	2	
E—AUDITORY SYSTEM.								
(1) Acute Mastoiditis ...	Autrotomy and drainage	1	...	1		Pus present in Antrum, Mas- toid cells and lateral sinus groove. Lateral sinus and dura exposed at operation. Hearing good later.
F—LOCOMOTOR SYSTEM.								
(1) Ganglion ...	Excision ...	1	...	1	...	1		
G—SKIN and SUB-CUTANEOUS TISSUES.								
(1) Tumours—(a) Benign ...	Excision ...	2	...	2	...	2	Cyst due to onchocerca volvu- lus worm, 1; Cystic fibroma of elbow, 1.	
(b) Malignant	Excision ...	1	...	1	...	1		Round celled Sarcoma of cheek.
(2) Painful Scar ...	Excision ...	1	...	1	...	1	For ulcers, 2; for wounds, 2.	
(3) Ainhum ...	Amputation of toe ...	1	...	1	...	1		
(4) Skin-grafting ...	Skin-grafting...	...	...	4	...	4	
(5) Abscess and Necrosis of Jaw.	Sequestrotomy ...	...	...	1	...	1	
H—GENERAL DISEASES.								
(1) Syphilis ...	Intravenous enfusion with Salvarsan.	...	...	2+1	...	3	For 27 and 37 infections, 2; both cured. One case of Syphilitic Meningitis not improved.
I—INJURIES.								
(1) Crushed Legs ...	Amputation of ankle ... Amputation at site of election	1 ...	... 1	} 1	...	1	
	Total ...	...	...			
				53	5	58		

OPERATION TABLE—continued.

NATIVE HOSPITAL, ZUNGERU—MAY TO DECEMBER, 1912—continued.

SUPPURATION PERCENTAGE

Number of clean cases	...	...	...	35
Number of cases suppurating	...	...	...	1
Percentage of suppuration	...	...	...	2·85

SPINAL ANÆSTHETICS.

Total Number	...	...	...	24.
Operation	...	...	...	Radical cure of Hernia, 5; for Hæmorrhoids, 3; Appendicostomy and Cæcostomy for Dysentery, 5; Circumcision, 8; Excision of Hydrocele and Cyst of Epididymis, 3.
Dose of Stovaine used	...	...	...	4 c. grm. in 2 cases; 5 c. grm. in 17 cases; 6 c. grm. in 5 cases.
Anæsthesia	...	...	...	Perfect in 23 cases; imperfect in 1 case. One case needed 2 injections.
Ill effects at operation	...	...	...	Some vomiting in one case.
After effects :—				
(1) Headache...	...	...	...	Severe, 5; slight, 12; none, 7.
(2) Pain in back	...	...	...	Moderate, 21; none, 3.
(3) Other ill effects	...	...	...	None observed.

TABLE VII.

RETURN OF DISEASES AND DEATHS (OUT-PATIENTS) FOR THE YEAR 1912.

DISEASES.	EUROPEANS.						NATIVES.				
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.			Remaining end of 1912.
		Admissions.	Total Cases Treated.	Deaths.	Invalids			Admissions.	Total Cases Treated.	Deaths.	
INFECTIVE DISEASES :—											
Blackwater Fever...	...	8	8	3	2	...	...	...	...	...	...
Beri-Beri	16	16	4	2
Chicken Pox...	2	12	14	...	...
Cow Pox	1	1	...	...	...	...	4	4	...	...
Diphtheria	1	1	1	...	...	...	...	...	...	...
Dysentery...	...	29	9	...	...	...	6	324	330	8	4
Enteric Fever	...	1	1	...	...	1	...	1	1	1	...
Gangrene	4	4	1	...
German Measles	...	2	2	...	...	...	...	...	...	...	...
Gonorrhœa	2	2	...	...	...	29	1,061	1,090	1	24
Influenza	6	6	...	...	...	...	21	21	...	...
Leprosy	61	744	805	66	708
Madura disease	1	1	...	...
Carried forward	...	50	50	4	2	1	98	2,188	2,286	81	738

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1912—*continued*.

DISEASES.	EUROPEANS.						NATIVES.				
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.			Remaining end of 1912.
		Admissions.	Total Cases Treated.	Deaths.	Invalids.			Admissions.	Total Cases Treated.	Deaths.	
Brought forward	50	50	4	2	1	98	2,188	2,286	81	738
INFECTIVE DISEASES :— <i>contd.</i>											
Malaria	2	225	227	1	4	1	8	1,455	1,463	6	6
Measles	1	1	...	...
Mumps	1	1	...	...
Osteo-Myelitis, acute infective	7	7	...	...
Phagedæna	1	1	...	...
Pneumonia	1	1	1	...	...	2	70	72	21	2
Pyæmia	3	3	2	...
Pyrexia of uncertain origin	14	14	...	1	...	...	148	148	...	...
Rheumatic Fever... ..	1	9	10	...	2	...	5	450	455	...	4
Septicæmia	14	14	1	...
Sleeping Sickness...	7	11	18	8	4
Small Pox...	3	3	2	...	1	...	37	37	9	9
Syphilis	1	1	...	1	...	65	433	498	3	50
Tuberculosis	1	30	31	7	2
Whooping-cough	4	4	...	1
Yaws	6	73	79	...	2
GENERAL DISEASES :—											
Anæmia	25	25	...	1	1	1	83	84	...	2
Diabetes	2	2	...	...
Debility	30	30	...	...	...	...	19	19	2	...
Lymphadenoma	1	1	...	...
MALFORMATIONS :—											
Undescended Testicles	1	1	...	...
NEW GROWTHS, NON-MALIGNANT :—											
Lipoma	4	4	...	...
Fibroma	2	2	...	...	...	...	8	8	...	1
Chondroma	1	1	...	...
Papilloma	2	2	...	...
Pterygium...	1	1	...	...	...	...	2	2	...	...
NEW GROWTHS, MALIGNANT :—											
Carcinoma	1	1	...	1
Cyst	4	4	...	...
Chalazion	4	4	...	...
EFFECTS OF PARASITES :—											
Trematoda	3	3	...	...
Bilharzia hæmatobia	2	4	6	...	...
Cestoda :—	...	1	1	...	...	...	...	152	152	...	...
Tænia Solium	1	1	...	...	...	1	148	149	...	...
„ Saginata	3	3	...	1	...	...	161	161	...	1
Nematoda :—	5	5	...	...
Ascaris lumbricoides	38	38	...	...
Dracunculus	1	1	...	...	...	5	521	526	...	9
Filariasis	2	15	17	1	...
Ankylostomiasis	5	5	1	1
Oxyuris vermicularis	55	55	...	...
Insecta :—											
Pediculus Corporis	2	2	...	...	...	...	...	...	...	...
Carried forward ...	3	369	372	8	12	4	203	6,165	6,368	142	833

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1912—*continued.*

DISEASES.	EUROPEANS.						NATIVES.					
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.			Remaining end of 1912.	
		Admissions.	Total Cases Treated.	Deaths.	Invalids.			Admissions.	Total Cases Treated.	Deaths.		
Brought forward ...	3	369	372	8	12	4	203	6,165	6,368	142	833	
EFFECTS OF PARASITES:— <i>cntd.</i>												
Pulex penetrans ...	...	2	2	...	...	...	...	53	53	...	3
Arachnida :—												
Sarcoptes Scabiei ...	...	...	...	...	...	...	...	25	25	...	...
Unclassified :—												
Craw-Craw ...	...	...	...	...	...	...	14	379	393	...	2
Hyphomycetes :—												
Tinea trichophytina ...	...	2	2	...	...	...	...	22	22	...	...
„ tonsurans ...	...	...	...	...	...	...	...	7	7	...	...
„ circinata ...	...	2	2	...	...	...	...	14	14	...	...
„ cruris ...	...	3	3	...	...	...	...	...	...	...	...
EFFECTS OF INJURIES ;—												
Burns ...	...	2	2	...	...	...	1	72	73	1	4
Sunstroke ...	...	20	20	1	1	...	...	5	5	1	...
Shock ...	...	...	...	...	...	...	...	1	1	1	...
Abrasions ...	...	1	1	...	...	...	4	19	23	...	2
Contusions ...	...	5	5	...	...	...	2	271	273	...	3
Wounds ...	...	9	9	...	...	...	33	2,000	2,033	...	25
Wounds, gun-shot	...	...	...	...	...	...	...	7	7	1	1
„ arrow ...	...	1	1	...	...	...	...	12	12	...	1
Sprains ...	...	4	4	...	...	...	...	78	78	...	...
Fractures ...	1	5	6	...	...	...	5	28	33	3	2
Dislocations ...	...	...	...	...	...	...	1	3	4	...	1
Other major injuries	...	...	...	...	...	...	...	15	15	6	...
Other minor injuries	...	34	34	...	...	1	54	2,063	2,117	...	34
EFFECTS OF FOREIGN BODIES :—												
In Eye ...	...	1	1	...	...	...	...	14	14	...	...
In Ear ...	...	...	...	...	...	...	...	13	13	...	...
EFFECTS OF POISONS :—												
Mercury ...	...	1	1	1	...	...	...	1	1	...	...
Venom of Snake ...	...	2	2	...	...	...	...	17	17	...	...
„ „ Scorpion ...	...	...	...	...	...	...	...	31	31	...	...
„ Stinging Insects ...	...	6	6	...	...	...	...	15	15	...	...
Undefined Irritants	...	3	3	...	...	...	...	2	2	...	...
DISEASES OF THE NERVOUS SYSTEM :—												
Neuritis ...	...	2	2	...	...	...	...	42	42	1	...
Polyneuritis ...	...	1	1	...	...	...	...	...	...	...	...
Myelitis ...	...	...	...	...	...	...	...	1	1	1	...
Amyotrophic lateral sclerosis ...	...	...	...	...	...	...	...	1	1	1	...
Progressive muscular atrophy...	...	...	...	...	...	...	...	1	1	...	...
Paralysis ...	...	...	...	...	...	...	1	1	2	...	...
Paraplegia ...	...	...	...	...	...	...	1	...	1	...	...
Hemiplegia ...	...	...	...	...	...	...	...	1	1	...	...
Cerebral diplegia ...	...	...	...	...	...	...	...	1	1	...	...
Torticollis...	...	...	...	...	...	...	...	1	1	...	...
Epilepsy ...	...	...	...	...	...	...	1	8	9	1	...
Vertigo ...	...	...	...	...	...	...	...	5	5	...	...
Carried forward ...	4	475	479	10	13	5	320	11,394	11,714	159	911	

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1912—*continued.*

DISEASES.	EUROPEANS.						NATIVES.					
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.
		Admissions.	Total Cases Treated.	Deaths.	Invalids.			Admissions.	Total Cases Treated.	Deaths.		
Brought forward ...	4	475	479	10	13	5	320	11,394	11,714	159	911	
DISEASES OF THE NERVOUS SYSTEM :— <i>contd.</i>												
Headache	2	2	...	...	...	...	135	135	...	...
Neuralgia	17	17	...	...	1	...	90	90	...	1	
Hysteria	1	1	...	...
Neurasthenia	14	14	...	4	...	...	7	7	...	...
Mania, acute	2	2	...	1	...	...	3	3	...	1	
„ puerperal	1	1	...	...
Melancholia	2	2	...	1	...	...	...	...	...	...
Mental Stupor	2	2	...	1	
Delusional Insanity	1	1	...	...
General paralysis of the insane	1	1	...	1	...	...	1	1	...	...
Senile Dementia	1	1	...	...
DISEASES OF THE EYE :—												
Conjunctivitis ...	1	14	15	...	...	...	10	679	689	...	10
Keratitis	1	8	9	...	...
Ulcer of Cornea	2	2	...	...	...	1	12	13	...	1	
Iritis	1	1	...	...	...	...	20	20	...	...
Retinal Hæmorrhage	1	1	...	1	...	...	2	2	...	...
Hypopyon...	2	2	...	1	
Cataract	5	5	...	...
Panophthalmitis	1	1	...	...
Nyctalopia	1	1	...	...
Myopia	2	2	...	...
Hypermetropia	1	1	...	...
Abscess of Lacrymal Gland	1	1	...	...
Dacryo-Cystitis	2	2	...	...
Blepharitis Marginalis	6	6	...	...
Sty	15	15	...	...
Opacity	2	2	...	...
DISEASES OF THE EAR :—												
Inflammation, External Meatus	4	4	...	...	...	...	38	38	...	...
Accumulation in External Meatus of Wax	5	5	...	...	...	...	22	22	...	...
Inflammation Middle Ear...	...	1	1	...	...	...	...	33	33	...	1
Perforation of Membrana tympani	16	16	...	...
Obstruction of Eustachian tube	1	1	...	...	...	...	1	1	...	...
Deafness	2	2	...	...
DISEASES OF THE NOSE :—												
Rhinitis	2	2	...	...	...	...	10	10	...	...
Epistaxis	1	1	...	...	...	...	...	...	...	...
Naso-pharyngeal catarrh	6	6	...	...	...	...	2	2	...	...
DISEASES OF THE CIRCULATORY SYSTEM :—												
Endocarditis	1	1	...	...
Carried forward ...	5	551	556	10	21	6	332	12,520	12,852	159	927	

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1912—*continued*.

DISEASES.	EUROPEANS.						NATIVES.					
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.			Remaining end of 1912.	
		Admissions.	Total Cases Treated.	Deaths.	Invalids.			Admissions.	Total Cases Treated.	Deaths.		
Brought forward ...	5	551	556	10	21	6	332	12,520	12,852	159	928	
DISEASES OF THE CIRCULATORY SYSTEM :— <i>contd.</i>												
Valvular Disease, Mitral ...		2	2	...	...	...	...	21	21	7	...
" " Aortic ...		...	...	...	...	...	...	5	5	4	...
" " Pulmonary ...		...	...	...	...	...	...	1	1	...	...
Myocarditis ...		...	...	...	...	...	...	3	3	1	2
Syncope ...		...	...	...	...	...	...	1	1	...	...
Disordered action of Heart ...		2	2	...	...	...	...	6	6	...	...
Phlebitis ...		1	1	...	...	...	...	...	...	...	...
Arrhythmia ...		...	...	...	...	...	...	1	1	...	...
DISEASES OF THE RESPIRATORY SYSTEM :—												
Asthma ...		...	...	...	...	...	...	6	6	...	...
Laryngitis ...		5	5	...	...	...	...	15	15	...	...
Tracheitis ...		...	...	...	...	...	1	4	5	...	...
Bronchitis ...		36	36	...	...	...	17	1,127	1,144	2	10
Hæmoptysis ...		...	...	...	...	...	...	1	1	1	...
Broncho-Pneumonia ...		...	...	...	...	...	1	1	2	...	...
Phthisis ...		...	...	...	...	...	...	9	9	2	1
Pleurisy ...		4	4	...	...	1	...	64	64	1	1
DISEASES OF THE DIGESTIVE SYSTEM :—												
Stomatitis ...		5	5	...	...	...	...	24	24	...	...
Cancrum-oris ...		...	...	...	...	...	...	1	1	...	...
Inflammation, Jaw... ..		...	...	...	...	...	...	1	1	...	...
Caries, Dentine ...		6	6	...	...	...	...	117	117	...	1
Inflam. Dental periostem ...		2	2	...	...	...	...	5	5	...	1
Suppuration, Gums ...		3	3	...	...	...	...	...	...	...	...
Toothache ...		3	3	...	...	...	1	11	12	...	...
Glossitis ...		...	...	...	...	...	...	1	1	...	...
Sore Throat ...		1	1	...	...	...	...	8	8	...	...
Tonsilitis ...		21	21	...	1	...	2	46	48	...	...
Elongated uvula ...		...	...	...	...	...	...	1	1	...	...
Inflam. parotid gland ...		...	...	...	...	...	...	2	2	...	...
Pharyngitis ...		9	9	...	...	...	...	24	24	...	...
Gastritis ...		22	22	...	...	...	...	93	93	...	...
Ulceration of Stomach ...		...	...	...	...	...	...	2	2	...	...
Indigestion... ..		38	38	...	...	...	1	229	230	...	1
Gastralgia ...		3	3	...	...	...	2	114	116	...	...
Enteritis ...		19	19	...	...	...	...	19	19	1	...
Appendicitis ...		...	...	...	...	...	...	2	2	1	...
Colitis ...		14	14	...	1	...	...	10	10	1	...
Hernia, umbilical ...		...	...	...	...	...	...	1	1	...	...
" Inguinal ...		1	1	...	...	...	3	44	47	...	...
Obstruction, Intestines ...		...	...	...	...	...	...	3	3	1	1
Diarrhoea ...		25	25	...	...	...	...	580	580	10	8
Constipation ...		3	3	...	...	...	...	1,402	1,402	...	...
Colic ...		2	2	...	...	...	...	264	264	...	...
Periproctitis ...		1	1	...	...	...	...	...	...	...	...
Fistula in Ano ...		1	1	...	...	...	...	3	3	...	...
Piles ...		5	5	...	...	...	1	21	22	...	2
Prolapse, rectum ...		...	...	...	...	...	...	1	1	...	...
Carried forward ...	5	785	790	10	23	7	361	16,814	17,175	191	955	

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1912—*continued*.

DISEASES.	EUROPEANS.						NATIVES.				
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.			Remaining end of 1912.
		Admissions.	Total Cases Treated.	Deaths.	Invalids.			Admissions.	Total Cases Treated.	Deaths.	
Brought forward ...	5	785	790	10	23	7	361	16,814	17,175	191	955
DISEASES OF THE DIGESTIVE SYSTEM :— <i>contd.</i>											
Hepatitis ...	...	19	19	...	...	...	...	14	14	1	...
Congestion of Liver ...	...	7	7	...	...	...	...	1	1	...	...
Jaundice ...	...	3	3	...	1	...	...	7	7	1	...
Peritonitis ...	...	...	...	...	...	...	...	1	1	1	...
Dropsy ...	...	1	1	1	...	...	...	2	2	1	...
DISEASES OF THE LYMPHATIC SYSTEM :—											
Splenitis ...	...	...	...	...	...	...	...	5	5	...	...
Inflam. lymphatic glands ...	...	3	3	...	...	...	3	158	161	...	4
Suppuration „ „ ...	...	...	...	...	...	...	...	8	8	...	...
Lymphangitis ...	2	9	11	...	...	...	...	12	12	...	...
Elephantiasis ...	...	...	...	...	...	...	1	18	19	...	...
DISEASES OF THE THYROID GLAND :—											
Goitre ...	...	...	...	...	...	...	...	4	4	...	...
DISEASES OF THE URINARY SYSTEM :—											
Acute Nephritis ...	...	...	...	...	...	...	...	8	8	3	...
Pyonephrosis ...	...	...	...	...	...	...	...	1	1	1	...
Nephralgia ...	...	...	...	...	...	...	...	1	1	...	...
Renal Colic ...	...	2	2	...	...	...	...	3	3	...	...
Stricture ...	...	...	...	...	...	...	...	2	2	...	...
Inflammation of Bladder ...	1	2	3	...	...	...	...	13	13	...	...
Retention of Urine ...	...	...	...	...	...	...	...	4	4	...	...
Hæmaturia ...	...	...	...	...	...	...	...	2	2	...	...
Lithuria ...	...	1	1	...	...	...	...	...	...	...	...
Phosphaturia ...	...	1	1	...	...	...	...	...	...	...	...
DISEASES OF THE GENERATIVE SYSTEM :—											
Urethritis ...	...	5	5	...	...	...	...	3	3	...	...
Urethral fistula ...	1	...	1	...	...	...	...	1	1	...	...
Prostatitis ...	...	2	2	...	...	...	...	1	1	...	...
Abscess of Prostate ...	...	...	...	...	...	...	...	1	1	...	...
Phimosis ...	...	2	2	...	...	...	2	8	10	...	...
Paraphimosis ...	...	1	1	...	...	...	...	3	3	...	...
Ulcer, penis ...	...	...	...	...	...	...	1	1	2	...	...
Soft Chancre ...	...	...	...	...	...	...	1	40	41	...	5
Cedema, Scrotum ...	...	...	...	...	...	...	...	1	1	...	...
Hydrocele of Cord... ..	...	...	...	...	...	...	...	1	1	...	...
Varicocele ...	...	...	...	...	...	...	1	1	2	...	...
Hydrocele ...	...	...	...	...	...	...	...	72	72	...	1
Orchitis ...	...	1	1	...	...	...	...	43	43	...	1
Epididymitis ...	...	...	...	...	...	...	...	8	8	...	...
Atrophy of Testicle ...	...	...	...	...	...	...	...	1	1	...	...
Inflammation of Ovary ...	...	...	...	...	...	...	1	1	2	...	...
Inflammation of Uterus ...	...	...	...	...	...	...	1	1	2	...	...
Displacement of Uterus ...	...	...	...	...	...	...	...	2	2	...	...
Inflammation of Vagina ...	...	...	...	...	...	...	...	1	1	...	...
Carried forward ...	9	844	853	11	24	7	372	17,268	17,640	199	966

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1912—*continued*.

DISEASES.	EUROPEANS.						NATIVES.				
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.			Remaining end of 1912.
		Admissions.	Total Cases Treated.	Deaths.	Invalids.			Admissions.	Total Cases Treated.	Deaths.	
Brought forward ...	9	844	853	11	24	7	372	17,268	17,640	199	966
DISEASES OF THE GENERATIVE SYSTEM :— <i>contd.</i>											
Vesico-vaginal fistula ...	...	...	...	...	...	...	...	1	1	...	...
Ulcer, Vulva ...	...	...	...	...	...	...	...	1	1	...	...
Amenorrhœa ...	...	...	...	...	...	...	...	1	1	...	...
Dysmenorrhœa ...	...	...	...	...	...	...	...	4	4	...	...
Menorrhagia ...	...	...	...	...	...	...	...	1	1	...	...
Leucorrhœa ...	...	...	...	...	...	...	...	1	1	...	...
AFFECTIONS CONNECTED WITH PREGNANCY :—											
Abortion ...	...	...	...	...	...	...	...	1	1	...	...
AFFECTIONS CONNECTED WITH PARTURITION :—											
Retention of the placenta...	...	...	...	...	...	...	...	1	1	...	...
AFFECTIONS CONSEQUENT ON PARTURITION :—											
Post partum hæmorrhage...	...	...	...	...	...	...	...	1	1	...	...
Puerperal septic intoxication	...	...	...	...	...	...	...	1	1	...	...
DISEASES OF THE FEMALE BREAST :—											
Mastitis ...	...	...	...	...	...	...	...	1	1	...	...
Acute Suppuration ...	...	...	...	...	...	...	...	2	2	...	...
DISEASES OF THE ORGANS OF LOCOMOTION :—											
Osteitis ...	...	...	...	...	...	...	...	18	18	...	...
Periostitis ...	...	...	...	...	...	...	1	11	12	...	1
Caries ...	...	...	...	...	...	...	3	...	3	...	...
Necrosis ...	...	...	...	...	...	...	...	7	7	...	...
Arthritis ...	...	2	2	...	...	...	...	11	11	...	...
Synovitis ...	...	4	4	...	...	...	2	145	147	...	6
Ankylosis ...	...	...	...	...	...	...	...	1	1	...	...
Psoas Abscess ...	...	...	...	...	...	...	...	2	2	...	...
Myositis ...	...	...	...	...	...	...	...	5	5	...	...
Myalgia ...	...	23	23	...	...	...	6	902	908	...	9
Ganglion ...	...	...	...	...	...	...	...	23	23	...	...
Thecal Abscess ...	...	...	...	...	...	...	...	3	3	...	...
Bursitis ...	...	1	1	...	...	...	...	...	...	...	...
Ainhum ...	...	...	...	...	...	...	1	5	6	...	1
DISEASES OF THE CONNECTIVE TISSUES :—											
Inflammation ...	...	3	3	...	...	...	2	154	156	...	2
Abscess ...	...	10	10	...	...	...	12	298	310	2	5
Cedema ...	...	...	...	...	...	...	...	4	4	...	1
DISEASES OF THE SKIN :—											
Erythema ...	...	2	2	...	...	...	...	...	...	...	...
Urticaria ...	...	1	1	...	...	...	1	5	6	...	...
Eczema ...	...	5	5	...	...	...	...	65	65	...	...
Carried forward ...	9	895	904	11	24	7	400	18,943	19,343	201	991

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1912--*continued.*

DISEASES.	EUROPEANS.						NATIVES.				
	Remained end of 1911.	YEARLY TOTAL.				Remaining end of 1912.	Remained end of 1911.	YEARLY TOTAL.			Remaining end of 1912.
		Admissions.	Total Cases Treated.	Deaths.	Invalids.			Admissions.	Total Cases Treated.	Deaths.	
Brought forward ...	9	895	904	11	24	7	400	18,943	19,343	201	991
DISEASES OF THE SKIN :— <i>cntd.</i>											
Impetigo Contagiosa	1	1	...	...	...	1	18	19	...	1
Boil	32	32	...	...	1	3	164	167	1	5
Tropical Phagedæna	4	4	...	...
Herpes	3	3	...	...	...	...	22	22	...	...
Shingles	1	1	...	...
Pemphigus	2	2	1	...
Psoriasis	1	1	...	...	...	1	4	5	...	...
Dermatitis	3	18	21	...	...
Pityriasis	1	1	...	...
Ichthyosis	1	1	...	...
Wart	1	1	...	...
Corn	1	1	...	...	...	...	10	10	...	...
Seborrhœa	3	3	...	...
Sebaceous Cyst	2	2	...	...	...	...	1	1	...	...
Acne	2	2	...	...	...	...	1	1	...	...
Prickly Heat	10	10	...	...	...	...	...	...	...	...
Sycosis	1	1	...	...	...	...	2	2	...	...
Alopecia	1	1	...	...
Onychia	2	2	...	...	...	...	2	2	...	...
Whitlow	1	1	...	...	...	...	28	28	...	1
Ulcer	6	6	...	..	...	58	688	746	...	37
TOTALS ...	9	957	967	11	24	8	466	19,915	20,381	203	1,035

SANITARY REPORT.

(A.) GENERAL REVIEW OF WORK DONE, LAWS PASSED, AND PROGRESS MADE.

(I.)—ADMINISTRATIVE.

The ground covered during the year by the Sanitary Officers in the course of tours of inspection included the Provinces of Kabba, Bassa, Nassarawa, the River Benue from Lokoja to Yola, together with the stations along its course, the Provinces of Bornu, Kano and Sokoto, a considerable portion of the Province of Zaria, and the Kwongoma Division of the Niger Province.

In addition to this, a considerable portion of the Province of Nassarawa was traversed a second time, with special reference to the stations of Jemaa and Womba; while Zungeru, Lokoja, Baro, Minna, Kaduna, Zaria and Kano received particular attention.

The Sanitary Officer was absent on leave for nearly half the year, and it unfortunately became necessary that the Senior Sanitary Officer should act as Principal Medical Officer for a considerable time, so that, although a large part of the Protectorate was actually visited, the area directly dealt with was not so extensive as they had originally planned.

KABBA.

Early in the year, two outbreaks of disease had been reported from the Province of Kabba—one of Small Pox, the other an obscure disease attended by fever, cough and extensive mortality.

The epidemic of Small Pox had been reported by an African Non-Native Clerk from a small Customs station, called Igori, on the right bank of the Niger. On investigation, it was found that there had been no Small Pox at all in the place, but that the report had been founded on a few trivial cases of Chicken Pox.

Most rumours of the existence of Small Pox here are, unfortunately, well founded, and it is refreshing to encounter one which is not. Chicken Pox, however, is not always trivial, for, complicated by septic absorption, it is sometimes liable to become quite as fatal as is Small Pox.

The other epidemic, which had almost died out when the Province was visited, was undoubtedly one of Pneumonia. An apparently identical outbreak had been alleged to have decimated the same part of the Province about seven years before.

The centre of the outbreak was a Pagan town called Omjiami; it was stated by the natives that during the previous six months 122 persons out of a population of about 700 had died of the disease, and the place, together with the people and their habits, afforded a classical example of how epidemic Pneumonia becomes such a fatal disease in this country. The town occupies a bare wind-swept site. The situation is often damp and cold. The people wear practically no clothing, and they go to sleep on the bare earthen floors of their huts.

They soon feel chilled when cold weather sets in, and they seek warmth by huddling together and closing up the openings of their huts. The people stated that, in fatal cases, the illness was from three to six days' duration. At the time the region was visited, only three cases were remaining, one of which was moribund and ended fatally, but in all three an accurate diagnosis of Pneumonia was made, both clinically and by examination of the sputum.

The Sanitary Officer (the advice given by him was strongly supported by the Resident of the Province, who had accompanied him to Omjiami) impressed upon the people the necessity of observing for the future certain obvious and simple precautions which would probably avoid further similar epidemics; but whether the advice will bear fruit can only be found by future experience, the people concerned being among the most primitive of our Pagans.

At Ighita certain persons were said to be suffering from Sleeping Sickness, and the presence of tsetse flies in the region rendered the story one which had to be taken seriously; but careful clinical examination, together with blood examination of persons with suggestively enlarged cervical glands, failed to elicit even a suspicion of the disease. In some of the cases the cervical glands had been extracted, this being the usual native procedure when a person suspected of Sleeping Sickness presents enlarged cervical glands.

There is no doubt that Sleeping Sickness is endemic in certain parts of the Province of Kabba, and there are probably not many of the people—even the most backward of them—who do not know about the existence of the disease. But the instance mentioned here is only another example of the truth of the statement that, in or near a region where Sleeping Sickness is known, when the people are in doubt about the nature of a malady, they call it Sleeping Sickness.

As a matter of fact, in the typical instance in question not one suspected case presented either lethargy or any other sign of the disease except enlarged glands. Most of the people had enlarged glands; those who had enlarged cervical glands had them as part of a general glandular enlargement, and a very obvious cause of the glandular enlargement was found in the chiggers—and secondary ulcers arising therefrom—from which many of the people were actually suffering at the time, and from which still more of them had suffered.

The chigger, always a nuisance, becomes a very serious pest among naked savages who are given to sleeping on bare earthen floors.

Arrangements were made for the improvement or construction of certain rest camps along the roads, and for the re-arrangement of certain places where Political Officers occasionally reside. Such arrangements are among the most important questions calling for attention from the Sanitary Officers; for rest camps are often occupied by young newcomers, and small remote stations which constitute the headquarters of divisional or district Political Officers are apt to be occupied by junior officers, *i.e.*, officers least experienced in the hygienic dangers of the country.

In February, when the Province was visited, new permanent houses for the European Officers at Kabba, the Provincial Headquarters, had been erected or were in the course of erection on a new site which had been selected by the Sanitary Officer six months before. Those buildings have since been completed.

The station itself was in course of re-arrangement. The native town was much cleaner and generally better looked after than it had been less than

a year before, and arrangements were made for its future expansion being carried out on sound lines.

Although Kabba is a Pagan Province, and many of its people are among the most primitive and most backward in the Protectorate, its native towns merit a large share of attention; for the trade of the Province is considerable, and, according to the European traders at Lokoja, increasing and valuable. Tsetse flies are plentiful, and Sleeping Sickness is known to be endemic, and under such conditions a region whose people are becoming conscious of settled security and increasing prosperity requires to be narrowly watched.

BASSA.

The progress reported from the Province of Bassa continues to be steady, if slow.

Along the great trunk road which traverses the Province from Gbebe on the Niger well nigh to Bagana on the Benue, travellers are but little annoyed by tsetse flies, although those pests are abundant throughout the entire Province; and the improvement thus effected by the road is being steadily increased by the extension of the belt of short crops, *e.g.*, cotton, which borders both sides of it and keeps down exuberant vegetation.

The Sanitary Officer, who had travelled through the Province the previous year, was, on the whole, satisfied by the progress which he was able to record in 1912.

Arrangements were made for the remedy of some of the more glaring defects of the town of Gbebe. Gbebe is a riverside town, cut up and nearly surrounded by marshes which are in great part extensions of the Niger itself; the people are amphibious—or as nearly so as human beings can be—in their habits; they are keen traders and their transport is effected by canoes; many of them are often absent on trading expeditions, and it is very difficult to arrange for continuous local action among them. Very little if anything can be done in the way of draining the marshes, and the town will always be a mosquito-infested place. It is an old settlement; its people, like most riverside trading people, are most conservative; and, although the town is within sight of Lokoja itself, little beyond inducing the people to improve their latrine arrangements, burn or bury their rubbish, and keep their thoroughfares and compounds clean, can be hoped for for years to come.

There is no European factory at Gbebe, and no European, official or non-official, lives in constant touch with the town.

Dekina is a little Hausa town about a day's march inland from Gbebe.

Dekina is the headquarters of the Political Officer in charge of the division of the Province of which the town is the centre, and his quarters, although native-built, are well situated on a rising ground above and well away from the town.

While at Dekina, the Sanitary Officer had a meeting with the Sariki and his headmen, and in association with, and with the hearty support of, the Political Officer, he went into the condition of the town and its surroundings, indicating the lines on which further improvements should be conducted.

The Sanitary Officer noted much solid progress since his former visit to the town in the spring of the year before, such progress taking the form of

much greater general cleanliness, the straightening and widening out of the thoroughfares, and the construction of larger and more open compounds along them.

The Hausa settlers in the town are an alert, intelligent community of traders; they are anxious to stand well with the Government, without whose protection they probably could not live in the Province at all, and they are likely to go on well in the direction of sanitary reform.

At Ankpa, the headquarter station of the Province, permanent houses for the Europeans were, during the year, completed on a new site further up the hill.

The native quarter of the Government station, including the gaol and native hospital, were in course of renovation and re-arrangement.

The drawback to the site on which the new European bungalows have been erected is its being further distant from the water supply than was the old one, and no local supply is procurable by the sinking of wells. But this drawback was foreseen from the first and accepted, as it was realised that the new site was the only possible one.

At Ankpa, the difficulty of keeping down exuberant vegetation is a formidable one, but dhub grass, which is plentiful in the neighbourhood, is being steadily laid down, and this procedure will eventually solve the greater part of the clearing problem.

The native town of Ankpa is a Hausa settlement. The Okpoto or Igara town, *i.e.*, the indigenous native town, is some distance away in a kurumi up the hill, and, like most of the Okpoto towns, has, so far, to be very gently handled so far as such intimate matters as sanitary affairs are concerned.

The Hausa town is close to the stream and down water from the political station. Since the previous year, considerable improvement had been effected there; the town itself had been considerably extended; a good deal of the kurumi between the town and the stream had been cleared; and the area thus reclaimed had been brought under permanent cultivation.

In association with the Resident of the Province, the local Medical Officer and two other Political Officers, the Sanitary Officer held a meeting of the Sariki and leading men of the town. At the gathering, sanitary matters were carefully gone into; the lines on which further extensions should be effected were clearly laid down; arrangements were made for extending the salga system and for the clearing away of more of the kurumi; and better methods, suited to the locality, for the disposal of refuse by burial or by burning were described. It was also arranged that the new cemetery which the people had begun to lay out should be taken away to an adequate distance from the town. The people further arranged to have a new area, further away, prepared for the tethering of horses and imported cattle passing through the town.

Horses and imported cattle cannot live in Bassa; but large numbers are imported for local slaughter and for sale in the adjacent part of Southern Nigeria. This trade is entirely in the hands of the Hausa settlers and their itinerant congeners.

This native town enjoys the regular supervision of the Resident of the Province himself and of the local Medical Officer, and such supervision is much more intimate than is the case in most native towns, for the Hausas

inhabiting it are quite as much aliens in the Bassa country as are the European officers themselves.

The native towns between Ankpa itself and Bagana on the Benue are being slowly improved; but the rate of progress made at them cannot, of course, be compared with that which is maintained at Ankpa and at Dekina.

Along the main road from Gbebe to Bagana, the rest camps are all, with the exception of the one at Gbebe, clean and well situated; while the rest-houses themselves are well constructed and well maintained. The nature of the region itself renders it impossible to have a well-situated rest camp at Gbebe.

Although but little is being done in the Okpoto or Igara towns, for reasons indicated in previous reports, increasing security and expanding trade are bringing to the notice of an ever increasing number of the indigenous inhabitants what is being done in the Hausa settlements. This is bound to make some impression on them, and it will pave the way for greater activity among them later on.

NASSARAWA.

The Province of Nassarawa was in a condition of transition during the year. At the beginning of the year the main route to the tin-mining area, from Loko on the Benue to the Bauchi plateau, ran through the Province, but, during the year, a light railway was constructed from Zaria to Rahama, a point some 50 miles from Naraguta, and now the greater part of the transport of people and material is effected by the railway system, either via Baro and the Niger, or via Jebba and Lagos. It follows from this that the Province has, temporarily anyhow, lost much of its importance; but it may more than regain this, if the mining activity already in existence within its own boundaries becomes extensive.

The Province is chiefly inhabited by Pagans, although there are several fairly large Hausa communities in different places. It was visited twice during the year by the Sanitary Officer, in the early spring, and again in November and December.

Until recently, the Province has generally been entered at Loko on the right bank of the Benue, about a day by steamer from Lokoja.

Loko is a fairly large town and most of its inhabitants are Hausa speaking. At one time it was a very filthy, irregular town with stinking rubbish covering most of its river front.

At low water the town is well above the river level, and its surroundings are fairly dry; but at high water the river overflows its banks, floods the ground in front of the town, and forms marshes everywhere. The rise and fall of the Benue, in common with those of all our rivers here, are very great.

The improvement noted in Loko was very great when the condition of the town was compared with that of less than a year before. The river front was remarkably clean, and so also were the thoroughfares and the town generally.

Such reforms as seemed to be urgently called for were carefully described to the Resident of the Province, and the best lines on which to arrange extension of the town were suggested to him and to the Medical Officer. Loko is only occasionally visited by official Europeans.

The rest-house used by Government Officials is too close to the town, but no better site is obtainable for it on account of the flooded condition of the country during the rains. On the other hand there is a rest-house right inside of the town which is often occupied by European private travellers. The Sanitary Officer represented to the Resident the necessity for closing the town rest-house, and he promised that it should be closed.

In touring the Province, the Sanitary Officer was accompanied by Political Officers at Keffi, Womba, Jemaa Jigindi and Abuja, and by Medical Officers at Keffi, Womba and Jigindi. At each of the places named, except Womba, where there is no native town, he, being accompanied and supported by a Resident, inspected the town thoroughly with the Sariki and his headmen, and afterwards went exhaustively into the local sanitary conditions with them, finding his texts in actual defects which had been indicated to them on the spot. The points brought before those native potentates were the necessity of clearing bush—and trees as well in fly-infested areas—all of which were definitely indicated; the systematic construction of salgas; care of wells and other sources of water-supply; cleaning of towns and compounds; proper care of slaughtering grounds; burning and burial of rubbish and refuse; and segregation of cases of contagious disease. Of course the usual precautions against mosquitoes and flies were given a most prominent place.

It may be added that the Political Officers undertook to keep the native magnates alive to all the points raised and active in dealing therewith.

There are many rest camps along the roads which traverse the Province, some of them well situated and well maintained, others not. Those calling for amendment or for reconstruction on new sites were carefully gone into with the Political Officers concerned, who undertook to have the requirements met.

Now that the railway is being largely used for the transport of tin, the crowds of carriers who until recently were continually passing up and down the road between Loko and Naraguta have greatly decreased; and this change in itself will result in the neighbourhood of the rest camps being greatly improved.

During the year, indications of tin in different parts of it brought an unusually large number of non-official Europeans into the Province; the Resident in charge transferred his headquarters from Keffi to Jemaa, and the military headquarters were transferred from Keffi to Womba.

In association with the Resident of the Province, the Sanitary Officer planned the arrangement of Jemaa. Early in the year, in collaboration with political, medical and military officers, he had planned the arrangement of the new station at Womba—some four miles from the native town of that name—and, at his last visit, he arranged with the local Resident for the laying out of a new Hausa town in the vicinity.

At the date of his second visit he found the state of affairs at Jemaa, both station and native town, greatly improved, and he earnestly impressed the Resident with the necessity of jealously safe-guarding the water-supply against contamination in the event of a mining company, which holds mining rights up-stream, engaging in active operations.

At Womba he found that the station had been laid out and that the troops had entered their new lines. Certain amendments which were necessary were indicated by him and they will be effected without difficulty, for all of the buildings are temporary.

At Keffi, where there are two permanent houses, he indicated, in addition to ordinary routine sanitary matters calling for attention, certain reforms in housing which would be necessary, in the event of the station regaining its pristine importance; but, necessary repairs to the permanent houses excepted, such matters may remain dormant until affairs are more settled.

At all places which he visited alone, notably at Loko and Nassarawa, he made careful notes and afterwards went carefully into the requirements with the Political Officers concerned.

Sleeping Sickness is often reported from different parts of the Province, generally erroneously, but now and again correctly.

At Jigindi, where Sleeping Sickness had been reported in 1911, the whole population moved out in a body and, during the year, completed the erection of a new town on a fly-free site. This is the town planned by Dr. Parsons, as mentioned in the report for last year.

The Sanitary Officer found the town fully occupied, and the Sariki and his people willing and anxious to carry out the advice offered to them.

In co-operation with Dr. Courtney, he examined all the people, numbering 155; 23 of these had enlarged cervical glands, and a careful examination was made of their fresh blood; but no trypanosomata were found, nor did any one of them betray any suspicion of any kind of sickness whatever.

Tsetse flies abound in the Province. Arrangements were made with the Resident for keeping broad and well cleared the main roads, and a clearly defined scheme was laid down for the local segregation of any cases of Sleeping Sickness which might arise, in fly-free areas to be arranged by the Medical Officer posted to the Province.

The headquarters of the Medical Officer are now at Womba, he having moved thither with the military.

By the time the recommendations of the Sanitary Officer—none of them difficult, excepting the clearing of heavy vegetation in certain places—shall have been carried out, the Province will be a greatly improved one.

The question of Sleeping Sickness in Nassarawa will be touched once more in the following section dealing with the Benue.

THE RIVER BENUE.

In the autumn, while the river was sufficiently high for reasonably quick transport, the Sanitary Officer made a tour of it from Yola to where it joins the Niger at Lokoja, a stretch of some five hundred miles.

Of places actually on the river itself, an inspection was made of Yola, Numan, Lau, Ibi, Abinsi, Loko, Bagana and Umaisha; while Mutum Biu and Katsina Allah, which are inland from the river, were also visited.

As stated in a former report, a chain of marshes stretches behind both banks of the river practically all the way up to Yola. This means that, during high water, both banks are mosquito and fly-infested.

Yola is comparatively an old station for this country, it having been continuously occupied since 1901. The political station is in a state of tran-

sition at present, in consequence of a gradual change of site, previously recommended, being effected. For the time being it occupies two sites: the old one about three miles from the river, the new one, on which two new permanent houses have been built, about two miles north of the old one and about one and a half miles above and to the south-east of the new town of Jameta. In consequence of this the station covers an area the extent of which renders clearing operations expensive and laborious; but this drawback is a transient one, and will disappear when the whole station shall have been constructed on the new site. As has been stated before, military reasons were responsible for the occupation of the site which is being gradually evacuated. Planting of dhub grass was carried out, but, in consequence of the coarse variety planted, did not prove itself a success. It was arranged that a supply of seed of the proper variety should be obtained from Ibi, where it is plentiful.

In spite of the drawback mentioned, the state of sanitary affairs at Yola, both at the political station and at the two native towns, was found to be one of progress.

Of course, the buildings on the old site are badly in need of repair, but the time is approaching when they will be irreparable; and this is all part of the plan, for, when that time comes, final complete transfer to the new site will be assured.

Unfortunately, it was found that one of the new houses on the new site had been erected with its long axis running north and south, instead of east and west.

During the year the new native trading town of Jameta, which had become hopelessly filthy and congested, was transferred bodily to fresh ground; it was laid out on systematic lines, and it is now an admirable town. Such activity and enlightened diligence as were exercised by the Political Officer who effected the change constitute one of the chief levers for raising our level of public health.

In the old town of Yola the Resident of the Province has effected very considerable sanitary improvement by having successfully induced the Emir to make the people keep down exuberant vegetation by the extensive cultivation of short crops.

During the year an urgently needed reform was taken in hand, in the shape of a new native prison. The Resident was supervising this, with the help of the Medical Officer.

While at Yola, in association with the Resident and the Medical Officer, the Sanitary Officer had a meeting with the Emir and notables, when he went into the state of both Yola and Jameta with them and indicated the most pressing requirements thereof.

Numan is situated on the left bank of the Benue, opposite the mouth of the river Gongola. It is the headquarters of the Assistant Resident of that division of Yola Province, who has a permanent house there which is not suitable for the residence of an European and which ought to be converted into an office.

At Numan there is a Pagan town in addition to a Hausa one. The state of sanitation was found to be deplorable and a scheme of radical alteration was advised and adopted.

It was decided to move both the Pagan and Hausa towns to new sites; an orderly scheme of procedure was agreed upon, and it was arranged that

the change should be carried out under the supervision of the Medical Officer at Yola.

Lau is a little trading town, and is situated on the left bank of the Benue; it is about eighty miles below Yola, and is in the Province of Muri.

The inhabitants of the town are a mixture of Hausas and Nupes, the former largely outnumbering the latter.

The sanitary condition of the town is dominated by its relation to the river, for at high water the ground on which it stands is just above water-level and no more.

Very little can be done for this town; but what is feasible is not difficult to effect. Fortunately, when the Sanitary Officer visited the place the Political Officer in charge of the division was with him. Together they went into the state of the town with the Sariki and his henchmen. The Sanitary Officer clearly indicated the simple measures necessary for improvement; the Resident supported him, and they have probably been already effected.

MUTUM BIU.

This is the headquarters of an Assistant Resident. It is about seven miles inland from the left (south) bank of the river, and is approached from Shaaba, some distance down the river from Lau. For the first three miles the road from the river passes across an immense swamp overgrown with high grass and infested by *Glossina Tachinoides*. At Mutum Biu the Political Officer has a good two-roomed house, and it is furnished.

Unfortunately, the house has been erected too close to the native town. This state of affairs cannot be altered now, but it was arranged that no further extension of the town should be permitted in the direction of the Residency. The African non-native clerks live much too near the Residency; but it was arranged that, as their quarters called for renovation anyhow, they should be moved further away.

The native town, which is a Fulani one, is on a good sloping site with free surface drainage. Like most Fulani towns it is open, regular and clean, and the use of the salga is fairly common.

The prevalence of *Glossina Tachinoides* renders the keeping of horses and cattle impossible.

After having inspected the native town in association with the Resident, together with the Emir and his notables, the Sanitary Officer sketched to them the requirements of the place. That his advice will be acted upon is assured, as the Resident is often in the place, and the Emir is an intelligent prince of very considerable force of character.

Ibi is the headquarter station of the Province of Muri. There are five good permanent houses in the station, and all the European officials are consequently well housed.

The European employees of the trading firms along the river bank are in much too close proximity to the native population.

At Ibi *Glossina Palpalis* is common and Sleeping Sickness is endemic in the native town. Twenty-six cases of the disease have been recorded since June, 1911, and all of them have ended fatally. Cases of Sleeping Sickness

are all sent to a segregation camp which is situated at Wukari, a fly-free area.

It is a pity that Ibi is occupied at all, but it has to be on account of the importance of the spot; and, from the point of view of the Protectorate, to regret the occupation of Ibi is about as futile as it would be, from the point of view of the Empire, to regret the occupation of West Africa. It is almost superfluous to add that the European health record of the place has not been a good one.

The Sanitary Officer noted that, since he had been stationed at Ibi as Medical Officer in 1910, considerable clearing of bush had been effected to the south of the Europeans' compounds, but that more required to be done in the direction of the cultivation of short crops and the leaving of a belt of grass around the place, the burning of which at the end of the rains might exterminate some of the flies.

The station requirements were pointed out to the Resident, who promised his co-operation.

The Sariki and his headmen were addressed, touching the requirements of the native town, by the Sanitary Officer, in association with the Resident and Medical Officer, after they had all gone over the town together.

IBI is a place which receives much attention; it is, in many ways, an attractive place, and the Europeans quartered there become attached to it and very zealous for its improvement; but, at the best, it is never likely to be otherwise than unhealthy.

KATSINA ALLAH is approached by way of the Katsina river, which enters the Benue on its left bank at a spot in the neighbourhood of Abinsi. At high water an ordinary steam canoe takes about three-and-a-half days to ascend to the place, on account of the rapid current. Tsetse flies punish the traveller all the way. A Political Officer accompanied the Sanitary Officer to the place.

The Political Officer in charge of the district has a permanent two-roomed house, but the only permanent European resident in the place is the subaltern in command of the detachment from the company stationed at Abinsi.

To describe Katsina Allah briefly, the station and the native town are both on the right bank of the stream—the station up stream; the site is high, has a good slope to the stream, and is consequently dry; the official houses are about 250 yards distant from the stream; the temporary house of the officer is too close to the lines of his men; and the native town is some 350 yards distant from the soldiers' lines.

Tsetse flies—*Glossina Tachinoides* and *Palpalis*—are numerous; and there is little doubt that Sleeping Sickness is endemic at Katsina Allah, Old Katsina, a hamlet about five miles away, and at the neighbouring Turu hamlets. At his last visit to Old Katsina in September, Dr. Dalziel, of Abinsi, found the *Trypanosoma Gambiense* in the blood of a boy of ten years of age.

It was found that although much had been done in the way of clearing vegetation and the laying down of dhub grass, much more clearing and a certain amount of tree-felling required to be done. The Resident arranged to take this work in hand at once.

Supported by the Resident, the Sanitary Officer carefully described to the Sariki of Katsina Allah and to the Headman of Old Katsina what things, within their power, needed to be done. The Sariki of Katsina Allah, although an elderly man, is intelligent and keen, and he is likely to perform what he has promised; but it is otherwise at the tiny hamlet of Old Katsina, the headman of which is dull and rather stupid.

ABINSI is on the left bank of the Benue and, coming down river, is the last considerable place in the Province of Muri. Considerable improvements have been effected in the place since 1910; then there was only one permanent house, now there are three. The site has been extensively cleared, and a large part of its area has been planted with dhub grass. The native hospital is not sufficiently far removed from the house of the Medical Officer—only 150 yards.

The two good permanent buildings destined for use as a prison were being used as a store, no prisoners being in the station at the time it was visited. They are well situated in relation to the European quarter.

Improvement, in several directions, was noted in the native town.

Before leaving Abinsi the Sanitary Officer fortunately met the Resident in charge of Muri Province, with whom he carefully discussed the sanitary requirements of Ibi, Katsina Allah and Abinsi. The Resident promised to do all in his power to satisfy them.

At Loko, which has already been referred to in the section dealing with Nassarawa, a case of Sleeping Sickness was noted. The Sariki was wishful to drive the sick man out of the town; but he was advised not to do so, as he was in a fly-free quarter, while *Palpalis* was common in the vicinity. The Sariki and his headmen were evidently carrying out fairly well the instructions which they had received touching the sanitation of their town.

BAGANA, a Bassa town which has already been mentioned, was not in so satisfactory a condition as the Sanitary Officer had hoped to see after his visit earlier on in the year; and it was arranged that the state of affairs should be represented to the Resident of the Province.

UMAISHA, on the right bank of the Benue, is in the Province of Nassarawa. It is not a Government Station, but it contains the Freed Slaves Home, which is now run by the Sudan United Mission.

The Mission and Home occupy a high site well above the river. On the whole the site is kept well cleared, and extensive cultivation towards the river tends to lessen the prevalence of fly. Tsetse flies occasionally enter the houses during the wet season.

The station is well run, and the health of the European members of the mission, and also that of the children, has been fairly good.

The native town is on the bank of the river, about two miles above the Mission. Sleeping Sickness had been reported to exist in the town and, the day before the arrival of the Sanitary Officer, Dr. Courtney, the relieved Medical Officer who had been posted to Nassarawa, arrived on his way home. Dr. Courtney examined all the people of the town and, having found five cases with clinical signs and symptoms of the disease, left instructions for their segregation in conformity with the procedure followed in Nassarawa Province.

On his arrival the Sanitary Officer examined the five cases and took blood-films from each of them, but microscopical examination gave negative results.

He pointed out to the Sariki and his headmen what it was needful to do to safeguard the town from fly. Since then the maintenance of segregation and the carrying out of the necessary public precautions have been placed in the hands of the political authorities of the Province; and, of course, the Medical Officer is on the alert.

THE MOHAMMEDAN STATES OF THE NORTH.

During the year tours were made in the north, embracing considerable portions of the Sultanate of Bornu, the Emirates of Kano, Katagum, Hadeija, Katsina and Argungu, and the Sultanate of Sokoto. The progress made, and, still more, the hopeful signs of coming improvement were, on the whole, satisfactory. For example, after having left him at the southern boundary of the Province and having regained Sokoto, one of the Political Officers wrote to the Sanitary Officer concerned that, on his way back, he had found several headmen of towns already, on their own initiative, putting into active operation several of the new sanitary practices recommended to them. This was all the more encouraging, as those headmen were by no means sure that the Resident in question would pass through their towns on his return journey.

An alarming feature of the year was that the rains very nearly failed in many parts of the north, and many people escaped famine narrowly.

The rainfall in the north gives the observer an uncomfortable impression of slow, but sure, shrinkage. Of course the truth of this impression cannot be demonstrated by such an array of recorded facts as would carry conviction to a scientifically sceptical mind, for accurate observations have not been kept up for a sufficiently long time, but intelligent natives believe in a progressively shrinking rainfall. There is very convincing evidence that considerable areas have gone out of cultivation through lack of rainfall in comparatively recent times: and the proximity of the desert together with the wholesale manner in which bush fires and the ubiquitous goat are permitted to destroy the trees lead one to expect the same result as has been recorded from the same causes in other parts of the world.

As a general rule the drier the country is the less unhealthy it is, but this principle has its limits, for starvation is more dangerous to the public health than is the infected mosquito.

In Bornu sites were chosen for new permanent houses at Gujba, Maiduguri and Geidam. Similar selections were made at the station of Sokoto, and new permanent houses were actually completed at Maiduguri and Birnin-Kebbi.

The question of moving the headquarters of Katagum to Gadia still remains hung up, pending the securing, or the reverse, of assurance touching the water supply at the latter place.

An alleged focus of Sleeping Sickness in the Kwiambana district of the southern part of Sokoto Province was investigated, but no satisfactory evidence of the existence of the disease was elicited.

Sundry conferences, always in association with Political Officers, were held with native rulers and district headmen touching the sanitary questions

of importance within their several spheres of influence; and it was becoming increasingly evident that leading natives expected to be visited, as a matter of course, by Medical Officers of the Protectorate travelling on sanitary duties.

The desirability of vaccination and the wisdom of segregating lepers undoubtedly appealed to an increasing number during the year; while the fact that many diseases are water-borne or insect-borne was grasped by many more. The project of transferring the headquarters of Nafada to another site was abandoned.

The subject of the northern states was fully dealt with, so far as the portions toured are concerned, in interim reports during the year, and it does not seem necessary to do more than touch them here.

KWONGOMA DIVISION (SOUTHERN PORTION) OF NIGER PROVINCE.

Kwongoma is in the northern portion of the Niger Province, and the southern portion of the division, which had been unavoidably missed earlier in the year, was visited in December in association with the Divisional Resident.

The district is essentially a Pagan one, with small Hausa or Hausa speaking settlements in places.

Many of the people are obviously becoming Hausafied, and there can be little doubt that, within the next one or two decades, Hausa will have become the *lingua franca* of the entire region. This progressive change is steadily making communication with the natives easier, and understanding banishes their timidity.

In Kwongoma division alone the Resident performed nearly one thousand vaccinations during the year; most of those, certainly well over seven hundred of them, were successful, and they are not included in the official vaccination return for the year. Several fortunate factors contributed to this result: the Resident was liked by, and had secured the confidence of, the Pagans among whom his daily work lay; his people were not syphilitic, and he could safely practise arm to arm vaccination.

The Pagans are industrious and, as a rule, friendly; they keep their markets outside of their towns, which they do not encourage strangers to enter; they are free from venereal diseases; and, although they are taking to trading freely, they remain jealous of the sanctity of their women, so far as outsiders are concerned.

In many of the villages, until recently, the men were more numerous than the women; because, in the slave raiding days not long over, more females than males were captured; but now, the female members of the population are increasing steadily, both actually and relatively, and the birth-rate shows a welcome tendency to go up.

At Tegna, Gumna, Pongo and Kagara, conferences, in association with the Resident, were held with the local notables. The active interest displayed, and often the shrewd questions asked showed that sanitary knowledge was not being planted on barren soil.

After a conference held at Pongo, a secluded impregnable town of about 2,000 inhabitants, the headman and elders of the community promised that, if the Sanitary Officer would return with the Resident the following year, the whole community in a body would submit to vaccination.

When the primary distrust or timidity of such Pagans is overcome, they become most promising pupils of the teacher of sanitation.

During the year the Sarikin Tegini came into Zungeru; the Medical Officer in charge of the Native Hospital operated on him successfully for an old chronic affection, and this created a most satisfactory impression through a large part of the division.

LOKOJA.

The improvement of the native town made slow but steady progress during the year; the main road along the river front was carried to a distance of some two miles from the market-place, was enlarged until it extended almost to that road, and the slaughtering area received much attention.

The construction of salgas in the compounds was proceeded with, and the question of public latrines was carefully considered. Those latter, which are mostly along the road mentioned above, which runs along the river front, have never been satisfactory, and the end of the year did not see their final arrangement.

The possibility of replacing them all by salgas had not been determined, as it was doubtful if the saturation of the subsoil would permit their efficient use in some places. The next rains will settle this question once for all, and thereafter the salga shall be in use wherever possible.

A certain number of bucket latrines will probably be necessary always, and a greater expenditure of money for their proper upkeep will have to be faced than has hitherto been the case.

Several good cuttings were constructed and lined with laterite blocks for the purpose of carrying off storm water during the rains; but more such cuttings are required, and their construction ought to be continual *pari passu* with the opening out and extension of the town.

The statistics of sickness among the European employees of the trading firms during the year were of great interest; they proved conclusively how desirable it was that non-official should observe the same rule as official Europeans in regard to the distance of their residential quarters from natives.

The Niger Company's premises are right against the native town, nearer to it than are those of any other firm; and the figures of sickness among their European staff are the highest of all the firms—highest relatively as well as absolutely.

Of course, Malarial Fever is the commonest ailment.

The statistics compiled by the Senior Medical Officer demonstrated that the incidence of sickness among European employees of the firms was practically in direct ratio to the proximity of their quarters to the native town.

The state of affairs was brought to the notice of the representative of the Niger Company at Lokoja, and he promised to bring it before the ruling authorities of the Company.

Ample evidence was forthcoming that the natives around Lokoja had grasped the value of vaccination, for they kept flocking in voluntarily with their children to have them vaccinated.

Great difficulty was experienced in keeping the cantonment sufficiently cleaned during the rains. The extension of the cultivation of short crops lessened, but did not abolish, the difficulty.

Such clearing is, of course, a question of adequate labour, and adequate labour means a sufficient supply of money.

Further supplies of water were tapped on the face of Pati. This water was piped down the hill to storage tanks; from the tanks a pipe was led direct to the prison, which thus became supplied with Pati Spring water; and a standpipe was constructed, near the tanks, from which the members of the European community could obtain spring water by sending for it.

Considerable cultivation was carried out around the prison by the prisoners, and this lessened the clearing difficulty considerably in that locality. A new hospital was completed and occupied at the prison, whose requirements it was found to meet; while the prison itself was kept clean and in good sanitary condition generally.

Ice was regularly obtainable during the year, except on Sundays.

So far as European activity is concerned Lokoja is not such a busy place as it was formerly; the railway from Lagos being a much more commonly used avenue of approach to the country than is the river, but trading activity is probably as extensive as it ever was.

BARO.

Baro became, for the time being at least, a much less important place; the amalgamation of the Nigerian Railways resulted in the headquarters of the united systems being located at Ebute Metta, near Lagos; the Baro-Kano Railway Accountants' Office and Staff were transferred to Minna; and many of the operative staff were withdrawn.

This thinning out at Baro, however, is probably only temporary; for increasing trade and the opening up of the new coalfield behind Onitsha will, in all probability, eventually more than replace the recent decrease in population.

The Baro European Hospital was closed during the year.

MINNA.

Minna is at the junction of the two railway systems and is the present headquarter station of the Niger Province. Its population, European and African, steadily increased during the year; but no idea could be formed—nor can one be formed now—as to what its normal condition was likely to be.

The question of a satisfactory water-supply remained—and still remains—unsolved.

The necessity for laying out a further area for occupation by African non-native clerks and artisans was foreseen; but no idea could be formed of what the number of those people was likely to be; nor can any idea be formed

now, as it entirely depends upon how the Railway Authorities eventually decide to distribute their staff.

ZUNGERU.

At the end of the year the military were withdrawn from Zungeru, all except one company. This very materially relieved the congestion in the quarters of the Europeans, for the houses vacated by the officers were occupied by civilians.

The abolition of trench latrines in the native town and the carrying of excrement by tramway for trenching in an area well away from the town continued to be a complete success.

The supply of new iron dust-bins to the European houses, together with the efficiency of the incinerators for the disposal of combustible rubbish, conduced greatly to the good condition of the cantonment.

Small Pox, as usual, visited the station during the year; it was imported by some Zaberma people employed on the railway. But the local population continues to be more effectively protected by vaccination, and, with each outbreak, those attacked are found to be newcomers in increasing proportion.

The ice plant broke down for some months during the year, and the temporary lack of ice demonstrated to everybody what a great boon ice was in a country like this.

The accelerated train service to Lagos proved itself a great boon to invalids, for, travelling by the weekly boat train, it became possible for a sick man to be conveyed from the hospital to the ocean steamer in little over a-day-and-a-half.

KADUNA.

At the end of the year the military, withdrawn from Zungeru, took up temporary quarters at Kaduna, a point about fifty miles south of Zaria, where the railway crosses the river Kaduna for the second time.

Before this move had been effected the site was examined, touching its suitability for the purpose, by the Commandant, the Intelligence Officer and the Senior Sanitary Officer.

It was arranged that, during the occupation of the site by the military, regular observations of the neighbourhood, particularly during the rains, should be made and records of them kept, with a view to determining the residential possibilities of the region. Kaduna, which is really the centre of a very inviting region, is some 2,000 feet above the level of the sea.

Arrangements were made for the satisfactory sanitation of the place, during its occupation.

Until the advent of the military, Kaduna had only been a railway camp.

Kaduna enjoys the advantage of possessing an excellent water supply drawn from the river.

ZARIA.

Zaria remains in a transition stage. During the year it became certain that it was no longer going to be entertained as a possible future capital, but further railway extension—since sanctioned—towards the Bauchi Plateau was expected; and this expectation naturally added to the importance of the place.

The conversion of the Bauchi Light Railway to the normal African gauge may possibly lessen the importance of Zaria, for passengers will be able to travel on to the plateau without having to change trains there. On the other hand the importance of Zaria as a cotton centre is increasing, and it may be that local trade will increase as well.

During the year the population of the Sabon Gari increased, and, despite the vigilance of the Senior Medical Officer, the inevitable borrow-pits were constructed. The end of the year witnessed the passive resistance of the peccant parties whose duty it was to fill those borrow-pits up.

A large new condenser and a soda water plant were set up at the railway workshops; and, before the end of the year, condensed water had become plentiful, and soda water had become obtainable on the spot.

Tentative sites were selected for a new European Hospital, together with a Sisters' house to replace the closed Baro Hospital; but, later, the scheme became dormant, it being impossible to decide the most convenient spot for a new hospital, until it became possible to forecast, with something approaching accuracy, the proportional distribution of the European population.

KANO.

The condition of the native city of Kano continued to be very satisfactory during the year, the normal system of town-cleaning, together with the activities of the Dogarai told off for sanitary purposes, being maintained. The scheme of gradually filling up borrow-pits and burning combustible rubbish in them was slowly but steadily followed, and the condition of the city generally, and of the market and its surroundings particularly, continued to excite the admiration of the stranger.

Early in the year an epidemic of Influenza broke out in the native gaol and was attended by a high rate of mortality; while, later on, the usual annual outbreak of Small Pox made its appearance—rather prolonged on account of the delayed arrival of the rains.

The advent of the railway has naturally increased the number of European traders.

At the end of the year the normal European population at Kano was estimated at fifty.

The securing of an adequate water supply—a supply adequate to the growing necessities of the place—became a more pressing one during the year, and various schemes were considered.

The only scheme which carried the certainty of success with it was one for pumping water from the river Shalawa; but this was rejected, for the time being anyhow, as the cost seemed likely to be prohibitive.

Preliminary steps were taken to the damming of the small stream from which the Political Station had always derived its supply; but everybody concerned had misgivings arising from what they knew evaporation was likely to do.

The water level was reached in two places by Abyssinian well, but the earth hopelessly stopped up the perforations of the tube.

The Railway Authorities attempted to reach water by making a deep boring beside the Railway Station, but they had obtained no trace of water at the time they ceased boring.

(II.)—PREVENTIVE MEASURES.

MOSQUITO AND INSECT-BORNE DISEASES.

MALARIA.

During the year 2,014 cases of Malarial Fever were treated—309 Europeans and 1,705 natives. Of those, one European and six natives died.

The number quoted, of course, represents the number of individual admissions, not the number of persons.

The steadily increasing activities of the country, which have, to a large extent, been suddenly sprung upon it, bring in an ever increasing number of Europeans who have never been to the Tropics before; while the number of natives who now invoke the aid of the Medical Department—and who, until quite recently, would never have dreamt of doing so—is rapidly increasing.

It follows from this that it is quite possible for some years to come that Malarial Fever may increase statistically, while as a matter of fact it may be really decreasing.

Certainly one meets a very much smaller number of Europeans, now-a-days, each of whom regards an attack of Malarial Fever as an inevitable incident of his *annus medicus*, than was formerly the case.

The average European, with increasing knowledge of the subject, treats Malaria more seriously than he did at one time, and does not nearly so frequently try to treat himself without medical aid.

One interesting point arises here. Quinine, as generally taken now, is not so efficient a preventive as it used to be. Formerly it had to be taken in solution or in powder; now it is far too generally swallowed in the form of hard compressed tabloids, many of which are probably never digested at all.

At all stations to which Medical Officers are posted, regular examinations, which include particularly the quarters of the natives who reside at their stations, are made with a view to abolishing all possible breeding places of mosquitoes. At Lokoja, Baro and Zungeru, those inspections embrace the native towns as well as the cantonments themselves; while at Minna, Zaria and Kano they include the Sabon Gari.

Sabon Gari is a term applied to a new town for alien Africans. The usual precautions are practised: puddles and pools which cannot be drained are oiled; imperfectly protected water-tanks are oiled; roof gutters are carefully looked to; water lying in open vessels is discouraged, and, in incorrigible

cases, strong measures are invoked; empty tins and bottles are buried; borrow-pits are not permitted in stations, and every opportunity is taken to acquaint the natives generally with their dangers; stations are cleared so far as the available labour will permit; and watercourses in and near stations are kept as clear of vegetation as is possible in a country where paved or cemented watercourses and drain pipes do not exist.

Rest camps are, as a rule, kept at an adequate distance from native towns; and, ere long, there will be no exception to the rule.

European compounds are kept large for the purpose of diluting the community of native servants, and the quarter mile distance between European and native quarters is applied to all new places, and is aimed at in those places where formerly it was not applied.

In the way of personal prophylaxis the usual methods are practised by most Europeans. Among Europeans the use of the mosquito net is universal, and most officials are supplied with so-called mosquito-proof rooms. The reason for the use of the term "so-called" in this connection has been explained in former reports. Most Europeans take quinine daily, but it will be well were a larger number of them given to dosing their servants regularly as well.

Dinner is taken much too late by the average European. An earlier hour than 8 p.m., the usual one, would be much more suitable, for dining late means retiring late, and much infection is no doubt contracted between dusk and bed-time.

The use of the mosquito net continues to extend among the natives, and so also does the principle of growing short crops around their towns.

TRYPANOSOMIASIS.

There were 11 admissions for Sleeping Sickness, of which 8 ended fatally; but, of course, these figures give no reliable indication of the incidence of the disease.

In some parts of the country—the forest country in the south—many cases probably occur in villages concealed in dense kurumis, the existence of the villages themselves being unknown to all but their own inhabitants.

In the tsetse fly areas throughout the country, it is the practice to use every means to induce the natives not to settle there, and to induce those already settled in fly belts to move. But this is a counsel of perfection which is not likely to be widely acted upon for some time to come.

Roads passing through fly belts, particularly if the existence of Sleeping Sickness be suspected, are kept as broad and well cleared as possible, and in fly areas every effort is exercised to induce the people to clear bush and grow short crops. As mentioned in a former report, the freer intercommunication, encouraged by the peaceful security established by ourselves, is likely to result in the spread of Sleeping Sickness. It has already resulted in the spread of Trypanosomiasis in horses. There are not so many horses in the country to-day as there were ten years ago.

The disease is not found to be spreading so rapidly among the cattle for the simple reason that they do not travel to the same extent as horses, and their Fulani owners are very careful to keep them away from fly belts.

The tsetse fly itself seems to be increasing in some places, but this apparent increase may merely be a consequence of the fly being more diligently looked for.

When cases of Sleeping Sickness arise steps are always taken to isolate them in fly-free areas, *e.g.*, the camps at Zaria and at Wukari near Ibi, and the arrangement holding good in Nassarawa Province.

During tours by Sanitary and Medical Officers, means suitable for keeping down flies of all kinds are carefully explained to the leading natives.

YELLOW FEVER.

This disease is not known here, and it is not likely ever to become endemic, for probably every year the temperature falls sufficiently far to be incompatible with the continued life of the parasite.

In addition to the routine war on mosquitoes, the river steamers continue to be inspected at Baro and Lokoja, and special machinery is always contemplated at Offa in the event of the disease showing itself in Southern Nigeria.

FILARIASIS.

Sixteen cases, all native, were admitted, one of which ended fatally.

This number affords no indication of the prevalence of the disease; for numerous cases of Elephantiasis are to be seen daily in most parts of the Protectorate, while filariæ may often be found in the blood of patients which is being examined for something else.

EPIDEMIC DISEASES.

It is satisfactory to be able to repeat the statement that there is no evidence to show that either Plague or Cholera has ever obtained a footing in the Protectorate.

SMALL POX.

There were 47 admissions, 3 Europeans and 44 natives; 2 of the European and 11 of the native cases ended fatally.

It is known that one of the two Europeans who died had not been vaccinated since he was an infant.

As formerly reported, this disease is endemic here, and appears as an epidemic in various places every year. The mortality is often exceedingly heavy.

Vaccination is steadily appealing to an ever increasing number of the people.

The vaccination statistics for 1912 are interesting.

During the year, 10,112 vaccinations were performed, 8,670 of them were successful, 85·74 per cent. of successes, all of them personally verified by European medical men.

The figures for the previous year were 5,494 vaccinations with 3,879 successes.

Now the Medical Officers are not a bit keener to-day than they were years ago, and the figures quoted go entirely to prove how the virtues of vaccination are increasingly appealing to the natives.

Quite a large proportion of the successes was obtained in the hot, dry north, and this amount of success was the result of the use of powdered lymph.

DYSENTERY.

There were 496 admissions, 35 Europeans and 461 natives; 32 of the native cases ended fatally.

This disease is an endemic one which often shows epidemic exacerbations.

Infants escape to a large extent because they are always suckled for from two to three years; during this time, mothers' milk excepted, they are not given or permitted to have, any uncooked food. After a year old they are occasionally allowed sour milk, and beyond the milk they receive nothing to drink except an infusion of herbs made with boiling water.

Condensed water is supplied to Europeans in most stations, and there must be very few of them now who do not understand the necessity for sterilizing their water.

Probably many more Europeans would escape Dysentery altogether if they would consent to give up salads, but very few Englishmen will crucify the flesh to this extent.

Everything possible is done to induce the natives to look after their wells properly, and to safeguard their water-supplies generally; and increasing evidence is forthcoming that some of the injunctions and lessons are being acted upon.

The spread of Vaccination is proof that they will adopt new practices when they have become convinced of the efficacy of them; but they require a lot of convincing.

ENTERIC FEVER.

Two Europeans were admitted. There is reason to believe that those cases were really importations.

CHICKEN POX.

Fourteen natives were admitted.

Cow Pox.

There were one European and four native admissions.

DIPHTHERIA.

One European and one native were admitted, the former case ending fatally.

ACUTE INFECTIVE GANGRENE.

Five natives were admitted, and one of them died.

GERMAN MEASLES.

Two Europeans were admitted.

MEASLES.

Three natives were admitted.

INFLUENZA.

Six Europeans and 23 natives were admitted.

MUMPS.

One native was admitted.

WHOOPING COUGH.

Four natives were admitted.

PNEUMONIA.

Only two Europeans were admitted, but there were 84 native admissions, and 27 of them ended fatally.

Pneumonia has been included under Epidemic Diseases because it nearly always appears among the natives in epidemic form, just as influenza does, and it is often very difficult to say where pure Pneumonia ends and Influenza begins.

If a case of Pneumonia be traced carefully, it will generally be found that although perhaps that one case only was admitted to hospital, there are other cases where it came from.

It will be a long time ere our natives are taught that cold is to be repelled by clothing; not by huddling together and cutting off ventilation.

ENDEMIC DISEASES.

BERI-BERI.

Sixteen natives were admitted, and four died. This disease is much commoner in Southern than it is in Northern Nigeria.

It seems—along the Benue at any rate—to have been commoner in this Protectorate ten or eleven years ago than it is now.

KALA-AZAR.

One native was admitted with this disease, a rare, or unrecognized, one in this country up till now.

PYREXIA OF UNCERTAIN ORIGIN.

Seventeen European and 154 native admissions were so described. It is very probable that some of them were typical cases of Influenza, a form of fever which often remains undiagnosed—if not unnamed—at home.

RHEUMATISM.

Twelve Europeans and 510 natives were admitted with Rheumatic Fever.

Rheumatism is quite common wherever natives come much into contact with Europeans in any capacity which leads to deviation from their customary form of clothing, for this means approximation to European models with unsuitable fabrics. The disease is particularly liable to attack African non-natives.

It remains impossible to give any true idea of its incidence among the general body of indigenous natives; but the fact that it is not uncommon to discover cardiac lesions in bush natives who unexpectedly happen to be brought under treatment points to the disease not being rare among them.

LEPROSY.

Of this disease 744 admissions, all of them native, were returned, and 66 of them were fatal.

Of course these figures are trifling having regard to the great prevalence of Leprosy in the country.

The principle of segregating lepers is making steady headway; this is particularly the case in the north, as one would expect; segregation being essentially an administrative matter, and the ruling people in the north belonging to a race of administrators.

There is a large leper town at Sokoto, well laid out and well run, its only defect being that it is too near the city; but this will be remedied in time, as formerly reported.

In Bornu, there are admirably well run leper towns at Maiduguri and at Geidam; they are both of them self-contained, and they are patterns of what leper settlements ought to be.

Outside of Hadeija there is another one, and, considering that there is no Political Officer in residence there, and that it is seldom visited by a Medical Officer, it is very effectively run, and reflects great credit on the Emir. Of course, the hand of the Resident can be seen in its plan and manner of laying-out.

Small parties of lepers are also segregated in the Provinces of Nassarawa and Muri and elsewhere; but, Sokoto, Hadeija and Bornu excepted, the principle of segregation is still in its infancy in most parts of the country.

The Mallams trained in the Nassarawa Schools thoroughly understand the philosophy of segregation; and, as they spread over the country, each of them will be a focus of enlightenment on this, as on many another, matter.

TUBERCULOSIS.

This disease was responsible for 1 European and 30 native admissions, and 7 of the native cases ended fatally.

It is a source of thankfulness that Tuberculosis cannot really be called an endemic disease in the Protectorate; and it is probable that, in the cases now mentioned, either the patients themselves were importations or the infection was imported from without.

Were the disease to obtain a real footing in the country it would assume epidemic proportions on account of the conditions which have been mentioned in referring to Pneumonia. This is one of the most cogent arguments against associated cells in prisons.

When Phthisis Pulmonalis develops in an European or African non-native who has brought the infection into the country with him, it is apt to become acute and to run a very rapid course.

YAWS.

There were 77 admissions for this disease. Although there is a considerable amount of it in the country, it is patchy in its incidence, and a Medical Officer may sometimes do more than one tour without seeing a case.

VENEREAL DISEASES.

There were 496 admissions for Syphilis, and 3 of them ended fatally.

The statistics of Syphilis and Gonorrhœa are of as little interest as are those of Leprosy, having regard to the well-known wide dissemination of these diseases. As reported before, venereal diseases, Pagan areas excepted, are deplorably common everywhere, and there are places where the people who do not suffer from some form of venereal disease are in the minority.

NEW GROWTHS.

There were 27 admissions, 3 European and 24 native, for those affections. Two of them, both native, were returned as malignant—carcinomatous. Malignant disease is very rare in Northern Nigeria, although it is said to be fairly common in some parts of Southern Nigeria.

If later and wider investigation in this Protectorate confirm the alleged rarity of malignant disease within its confines—the disease has been carefully looked for, particularly since the members of the local medical staff were called upon to collect material and data for Cancer research—comparison of the conditions of life here with those in the regions of Southern Nigeria, where the disease is said to be prevalent, may be of interest ætiologically.

HELMINTHIC DISEASES.

ANKYLOSTOMIASIS.

This affection accounted for 1 European and 7 native admissions, and 1 of the latter ended fatally.

TAENIASIS.

There were 515 admissions for this affection, 5 Europeans and 510 natives.

BILHARZIA.

This accounted for 4 native admissions. Here again is a figure which cannot be taken seriously as an indication of the prevalence of the disease concerned. The explanation of this seems to be that the invasion, when it happens, does not give the average native any very distressing inconvenience; so that, even if he be in Government employment, he does not feel prompted to seek medical aid.

But it is certainly true of the Provinces of Bornu and Yola, and probably of other regions also, that, if a group of the people were collected and systematically examined, this affection would be found to be fairly prevalent among them.

TRICHINOSIS.

There were 7 European and 46 native admissions for this affection.

GUINEA WORM.

There were 1 European and 593 native admissions for this affection. A very large number of natives harbour this parasite from time to time.

NEMATODA—UNDEFINED.

Five native admissions were returned under this description.

ASCARIS LUMBRICOIDES.

Thirty-eight native admissions were so returned.

OXYURIS VERMICULARIS.

Fifty-five native admissions were returned under this heading.

TREMATODA—UNDEFINED.

Three native admissions were so described.

Helminthic diseases are common all over the country, and the natives—their habits constantly invite such invasions—treat them as a matter of course; in fact, the average native, if he thought about the matter at all, would regard himself as a rather peculiar person if he did not harbour intestinal parasites at some time of his life.

CHIGGERS.

Accounted for 2 European and 55 native admissions. Those pests are a sad nuisance in many parts of the Provinces of Kabba and Bassa.

(III.) GENERAL MEASURES.

SEWAGE DISPOSAL.

The dry-earth system of dealing with excrement is the only practical one for this country. The only places where water comes into the scheme of its disposal are Lokoja and Baro; at those places latrine buckets are emptied into the river.

For Europeans and for some of the natives at Government stations earth closets are provided, and the contents of the buckets are trenched daily.

Salgas are used by many natives and the use of them is being persistently pushed, wherever the ground is suitable for them, whether at Government stations or in native towns.

Open trench latrines are used at many places, but the use of them is not regarded as a permanent institution anywhere, and it is part of the general scheme of sanitation to replace them wherever possible by salgas or by earth closets in those places where the height of the subsoil water unfortunately renders salgas impossible.

During the year the introduction of salgas was begun at Lokoja, but public bucket latrines are still in use there and are far from satisfactory.

At Baro many natives are provided with earth closets, but trench latrines also are in use there.

At Zungeru all the natives use earth closets. Of course it will be understood that this does not apply to the natives who inhabit the native town—known as Kworra Town—beyond the cantonment boundary.

The number of latrine buckets emptied daily is 120 at Baro, 321 at Lokoja and 450 at Zungeru—average figures.

The large number dealt with at Zungeru is due to the use of trolleys and a tramway for the transport of ordure out to the country beyond the cantonment boundary.

For native use, the salga is both cheap and effective while the earth closet is expensive and never really effective, and the latrine trench is offensive—unless correctly used, which it seldom is.

The great difficulties in connection with the extensive use of earth closets are that the labour involved in dealing with them is great and costly; that the Africans—and this is just as true of the African non-native clerks and artisans who are supposed to have received some small smattering of European education, as it is of the most ignorant of the indigenous natives—cannot, as a rule, be induced or coerced to cover their dejecta with the dry earth provided for the purpose; and that, the labour which is possible to provide not being sufficient for constant uninterrupted supervision, they are generally offensive.

DISPOSAL OF REFUSE.

The rule at all Government stations throughout the Protectorate is that combustible refuse is burnt, and non-combustible buried, daily.

Incinerators are in use at some stations, *e.g.*, at Zungeru and Geidam, and their construction is being extended.

At Lokoja a certain amount of rubbish is still disposed of in the river.

In many of the native towns of the north, notably Kano, the intensive cultivation practised around them, which creates a good demand for manure, tends to the constant removal of refuse, and the cultivators understand the manurial value of refuse burnt on the land.

Apart altogether from this, the practice of town cleaning, without economic purpose, is spreading extensively over the country.

WATER-SUPPLY.

This is derived from rain-water tanks in connection with roofs, and from springs, streams, wells and marshes.

The roof supply is a very small source and only affects a proportion of the Europeans.

The water from springs and from some of the streams is comparatively pure, and stream or river water is generally at its best when it is taken from holes in the beds of dry watercourses.

Much of the water derived from wells is of very poor quality; and some of it, together with most of that taken from water-holes in marshes, is positively offensive.

At most stations, Europeans are daily supplied with a sufficiency of condensed water for drinking and cooking. All the drinking water supplied to prisons and native hospitals is boiled.

When a new station is planned on the bank of a stream it is arranged so that the native community lives and draws its water-supply down-stream from the European.

Every effort is made to induce the natives to bathe and to wash their clothes down-stream from the point at which they collect their drinking water.

Where Guinea Worm is traceable to a well or group of wells, steps are taken to have those wells filled in and new ones sunk.

A large part of the public activities of the Medical Officers is directed to the wells within their districts; everything possible is done to induce the natives to safeguard their wells by the construction of parapets, by keeping them well away from salgas and other sources of pollution, and by keeping the areas in which they are situated clear and clean, while many of the Political Officers use their unrivalled influence and opportunities to further this.

The natives are, wherever possible, warned of the danger of water-borne disease and how to avoid it.

DRAINAGE.

There is no system of piped or other form of underground drainage.

Surface drainage is effected by the natural slope of the ground towards streams and by small natural watercourses joining them. Where necessary, artificial trenches and courses are cut to carry off surface water to the watercourses and streams. Most roads in stations have small ditches at their sides, unless they keep permanently dry without them.

Over most parts of the country percolation is free, and, as a rule, fairly rapid.

At native towns, as a rule, little or nothing is done to assist natural drainage.

CLEARANCE OF BUSH, UNDERGROWTH, ETC.

After the dry season has become established, the ground is cleared of rank grass and undergrowth by burning.

At certain stations—such stations are very few in number—where the undergrowth never becomes dry enough to be burnt, it is grubbed up.

A considerable amount of labour is expended on clearing operations at the various stations during the months of July, August, September and October, the vegetation then being exuberant.

Bush is cleared well away from the inhabited parts of stations, and the clearing is made more extensive in regions where tsetse flies prevail.

The laying down of dhub grass continues to be practised, and the Director of Agriculture has arranged to experiment with *Paspalum Dilitatum*, a short grass from Natal, during the coming rainy season.

At native towns the practice of keeping rank growth away by surrounding the town with short crops, such as ground-nuts, sweet potatoes and beans, is steadily spreading.

B.—MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

LECTURES.

In the present state of the country, lectures, in the stilted sense of the term, are not very promising methods of diffusing sanitary enlightenment, but conversations with the more enlightened natives are, provided they be freely illustrated by examples observed on the spot by the teacher and natives together.

The conferences held in the course of tours of inspection with native magistrates, attended by their notables, by Sanitary or Medical Officers acting in association with Political Officers do a lot of real good; and, by keeping on pegging away, there is every reason for hoping that the progress thus effected may be enduring.

Such conferences are never held in the absence of Political Officers; it is by them that the native authorities are induced to adopt improved sanitary methods, and perfect confidence exists between them and the Sanitary and Medical Officers.

Care is taken, so far as possible, to so arrange Government stations that natives are unable to observe abuses there which would be condemned in their own towns, *e.g.*, if a native were to see a borrow-pit within the boundaries of a Government station, much teaching which he might have received touching the evils of borrow-pits would be rendered useless.

In teaching sanitation to the native, the principle inculcated must be : "Do as I do."

Again, in travelling on tour the thoughtful European does much good by himself looking to the sanitary arrangements of his own carriers at the daily camp; many different sets of natives travel with him, so that his practical teaching really appeals to a large audience.

SCHOOL TEACHING, ETC.

Elementary hygiene is taught at the Government Schools at Nassarawa; and one of the Medical Officers at Kano is now attached to the schools and Kano city, his duties being tutorial as well as medical.

During the course of the year a small handbook on the subject was placed in the hands of the Director of Education.

It is intended also that elementary physiology shall be taught, anatomical models being employed for the purpose of illustration, as diagrams are not likely to be of much use, for the present at all events.

Such teaching will also be taken up later at the Government School at Sokoto.

Apart altogether from such special teaching, however, the general result of the teaching received at the schools by natives of the upper classes from all parts of the country will eventually have an excellent influence in promoting hygiene and sanitation; for, when the pupils return home and demonstrate to their own people that the knowledge which has been imparted to them by the European is really valuable and of practical use, their people, in their turn, are likely to be induced thereby to treat seriously the instruction given them by the Sanitary and Medical Officers.

Those pupils at the schools who have not had Small Pox are all vaccinated; they continually have explained to them the efficacy of vaccination in protecting people from Small Pox; by clear illustration they are taught how it is that vaccination effects such protection; they are taught the history of vaccination in Occidental Europe; and those of them who have been successfully vaccinated have it continually pointed out to them, when Small Pox is around in epidemic form, how they—in common with those who have previously had Small Pox—are the only people among whom none is attacked.

Each pupil returns home to be a valuable supporter of the practice of vaccination in his own locality.

In like manner, the principles to be observed in guarding against water-borne and insect-borne diseases have their practice explained and their efficacy demonstrated by the pupils themselves being made to practise them during their life at the schools. The pupils are, of course, residential, the immunity to such diseases thus secured by them being constantly brought to their notice.

Many of those pupils will themselves become Sarakuna—a select few will succeed to emirates—and will be most useful potentates in enforcing the methods advocated by the members of the Medical Department.

C.—RECOMMENDATIONS FOR FUTURE WORK.

There is little to add to the recommendations which were put forward last year; even under the most propitious circumstances it will be years ere they can be carried out in their entirety.

It seems wise, however, to add two to their number. They are these :—

1. In advocating sanitary improvements and operations to ignore the Panama Canal Zone in every way, except profiting by the lessons so effectually taught there.

Here such lavish expenditure applied to sanitation can never be hoped for, and it will be necessary to work for the same results with much narrower means. On the principle of half-a-loaf being better than no bread, it is better to aim at what there is some chance of getting than it is to sigh for the unattainable.

This recommendation has special reference to housing. In a country with the resources of this Protectorate, for example, to press for the effectively complete mosquito-proofing of every European house would probably mean that many Europeans would never be adequately housed at all.

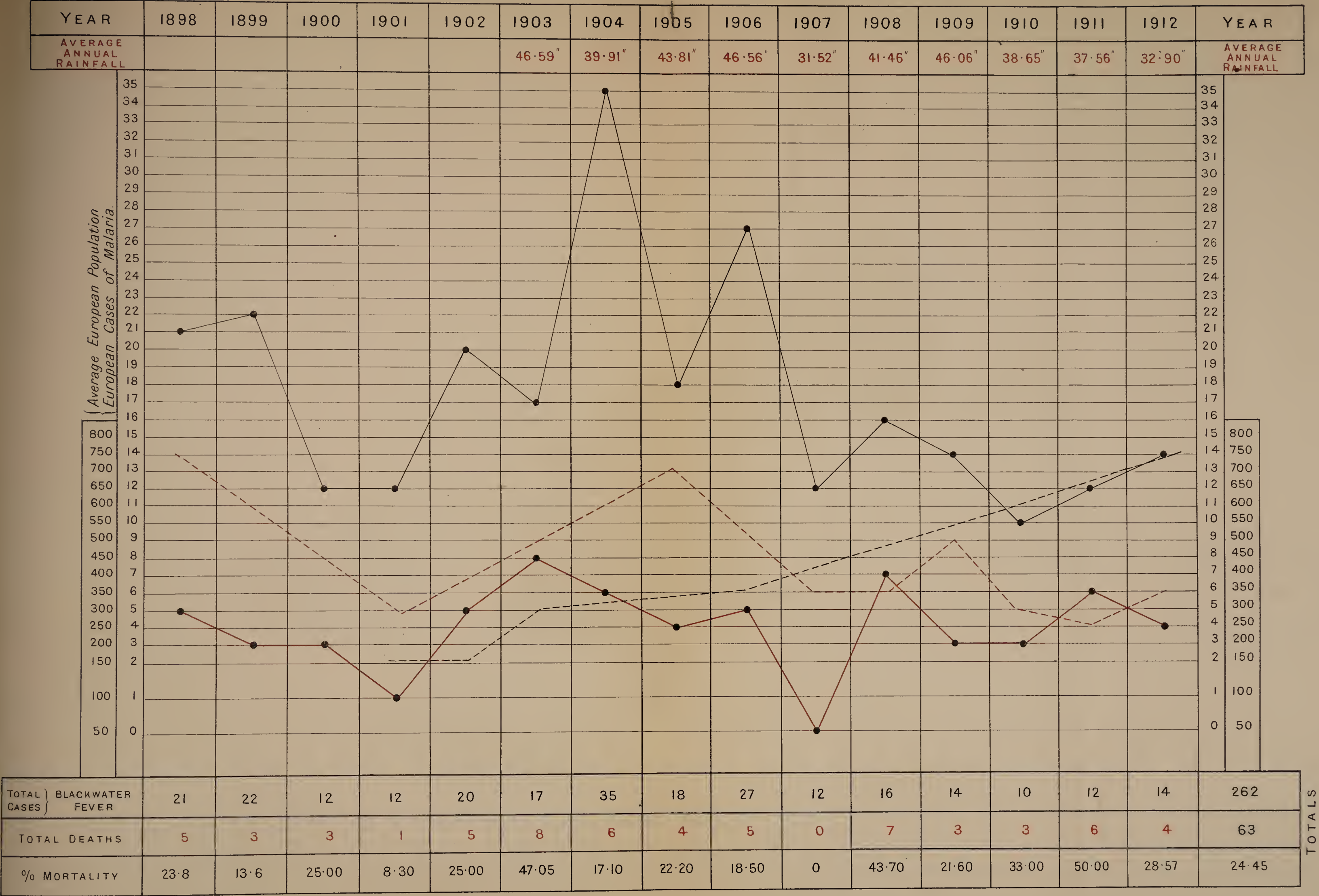
2. That the Sanitary Officers devote the greater part of their energies to the large native towns and to the regions of the country remote from medical activity, leaving the sanitary routine of those Government Stations to which their colleagues are posted to those Medical Officers, but rendering to their local colleagues at all times such counsel and support as may be necessary.

(Signed) M. CAMERON BLAIR,

Senior Sanitary Officer.



BLACKWATER AND MALARIAL FEVERS
YEARLY INCIDENCE OF CASES AND DEATHS 1898 - 1912.



1. Black Line, total cases of Blackwater Fever in one case per line.

3. Dotted Black Line, Average European Population in 50 per line.

2. Red Line, fatal cases " " " " " "

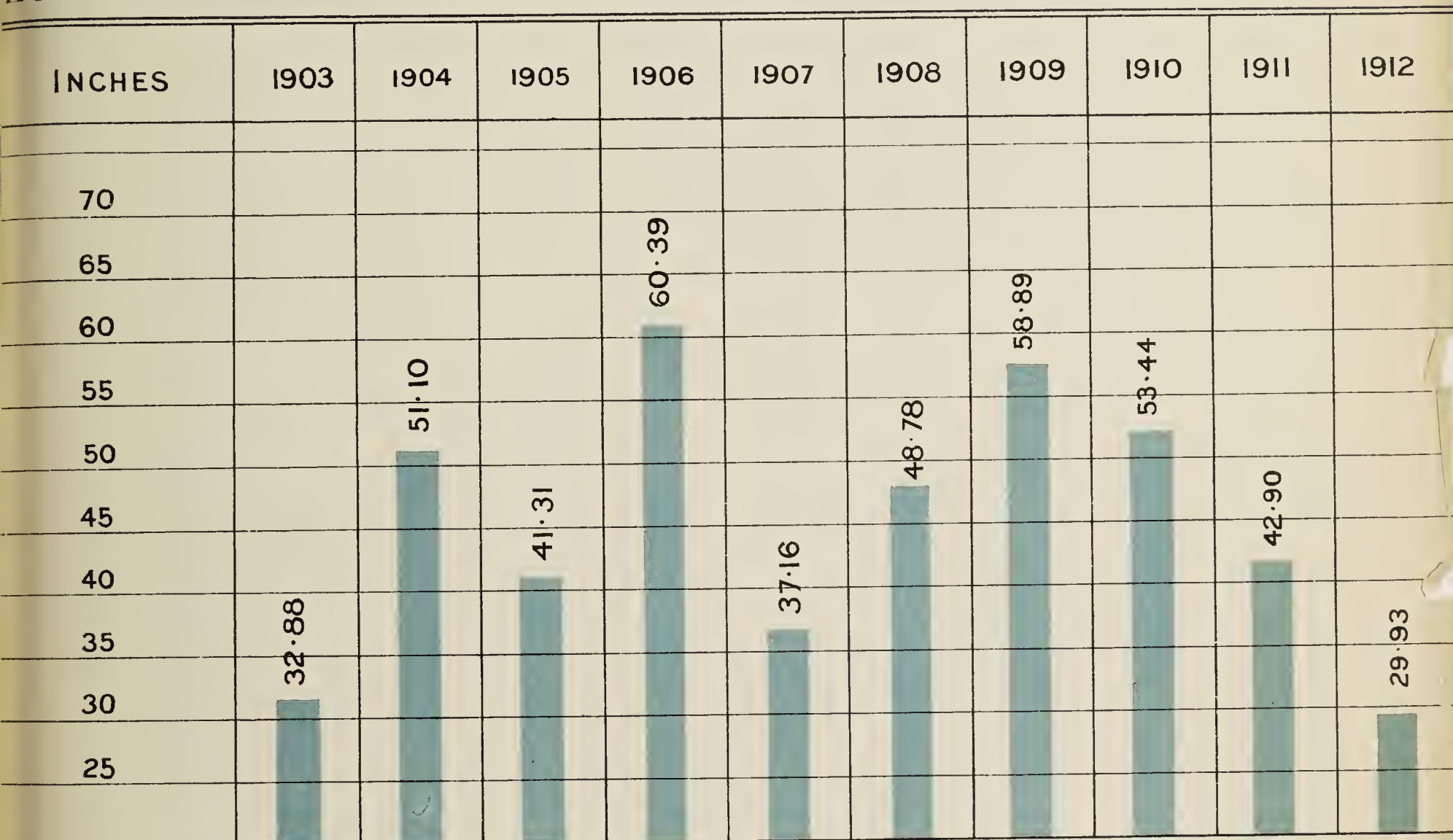
4. Dotted Red Line, European cases of Malaria 50 per line.



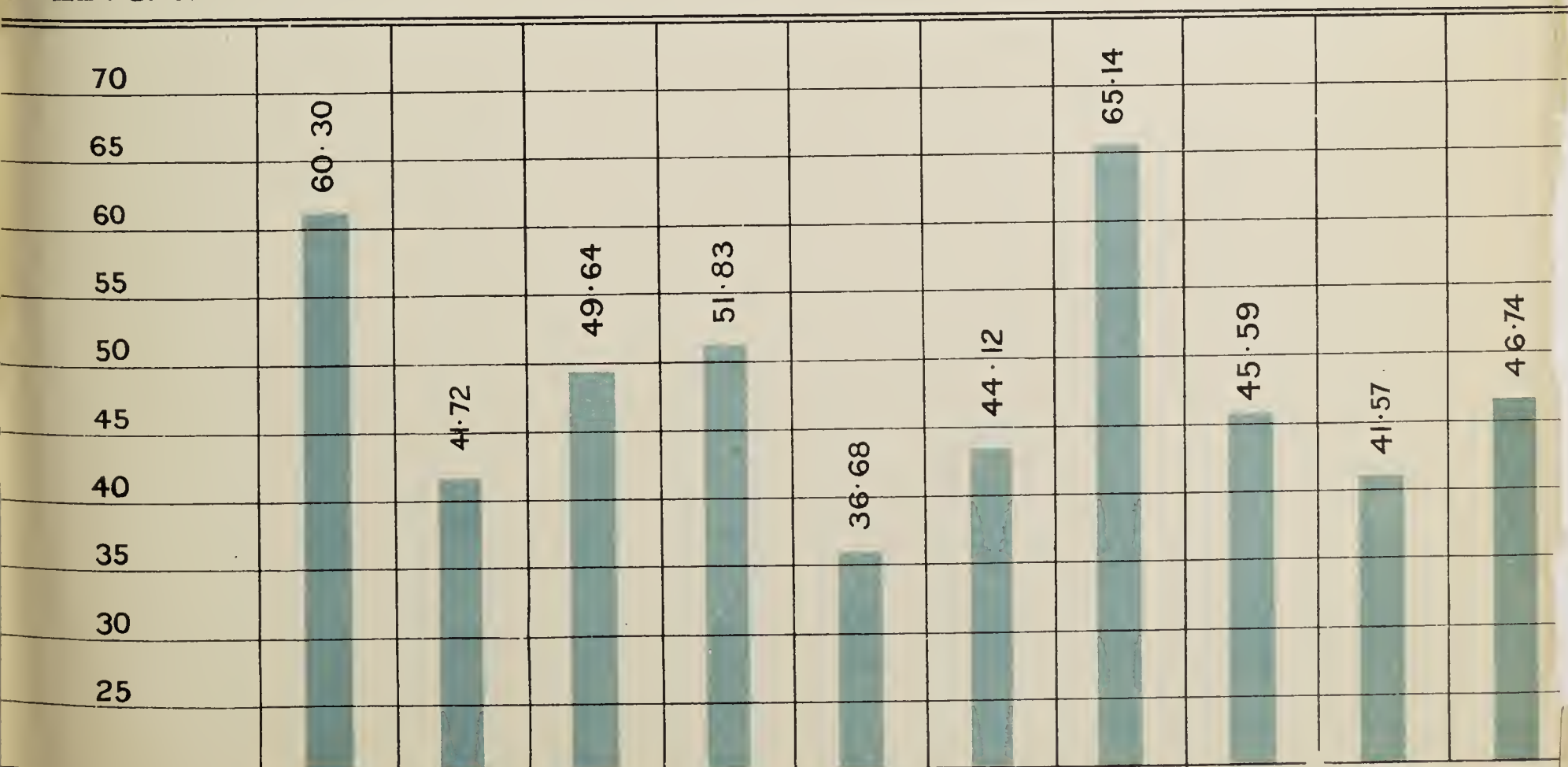
CHARTS SHOWING RAINFALL

Chart B

ZUNGERU

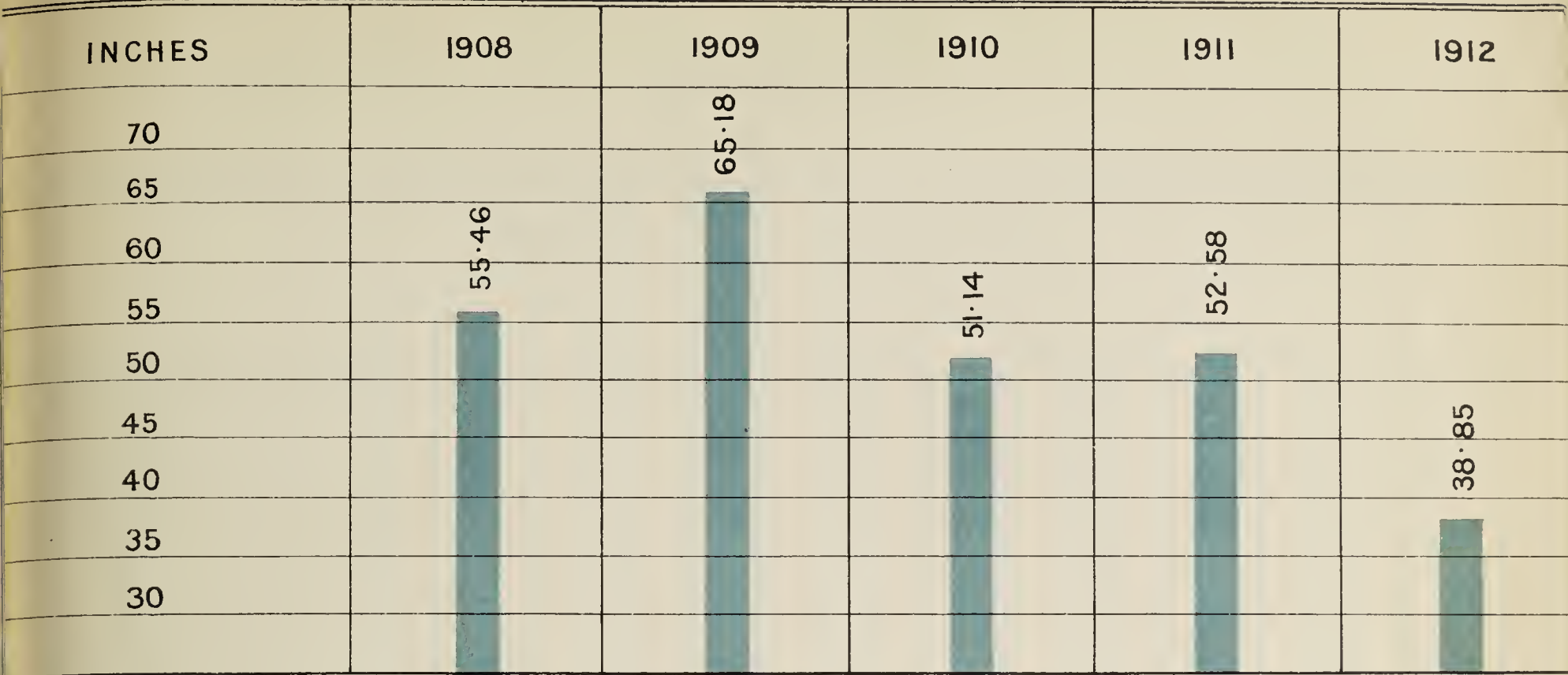


LOKOJA

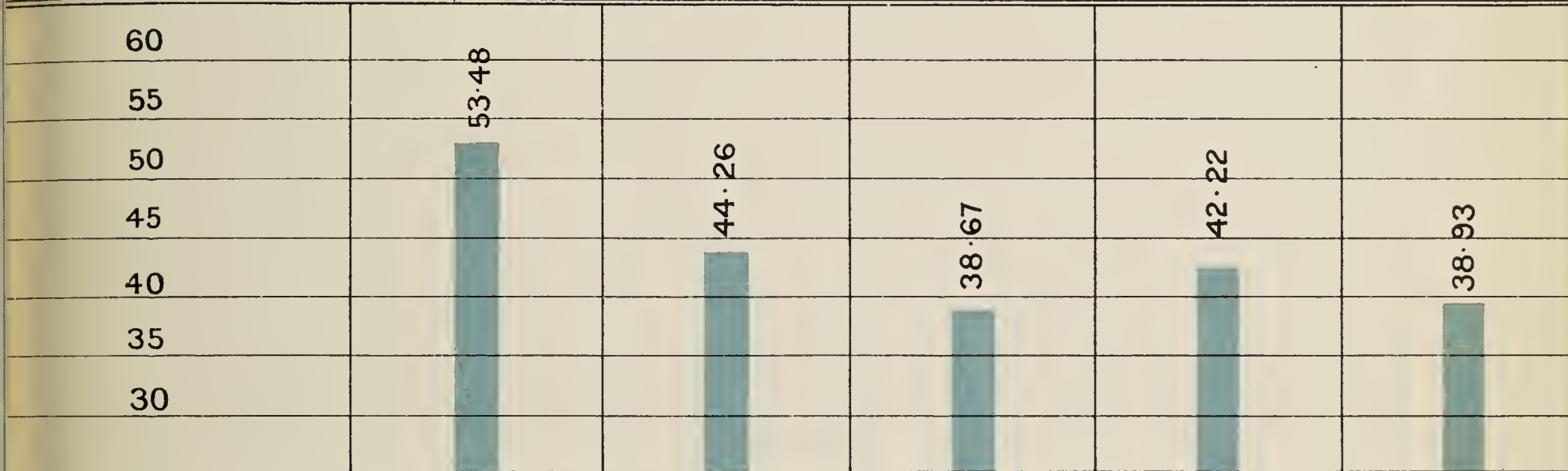


ILORIN

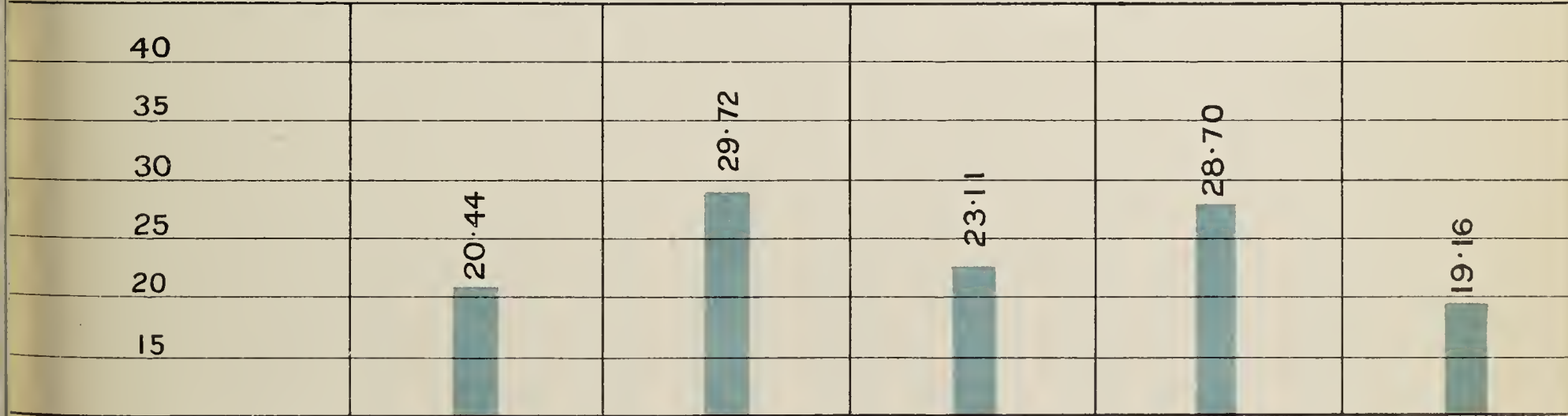
Chart C



YOLA



SOKOTO



KANO

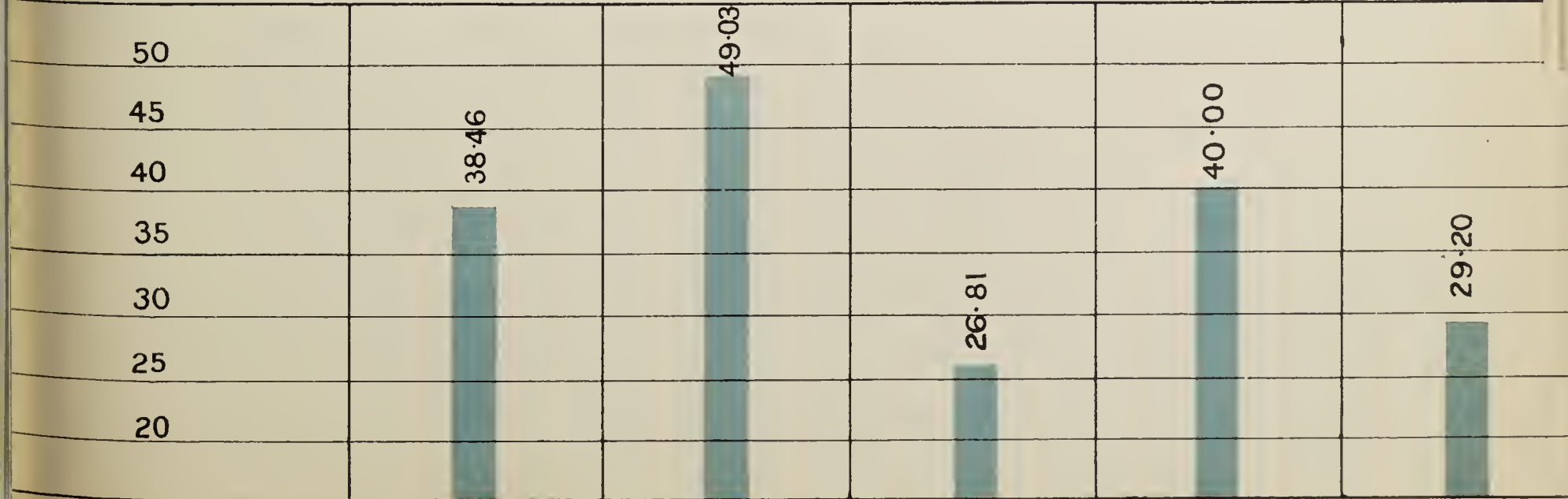
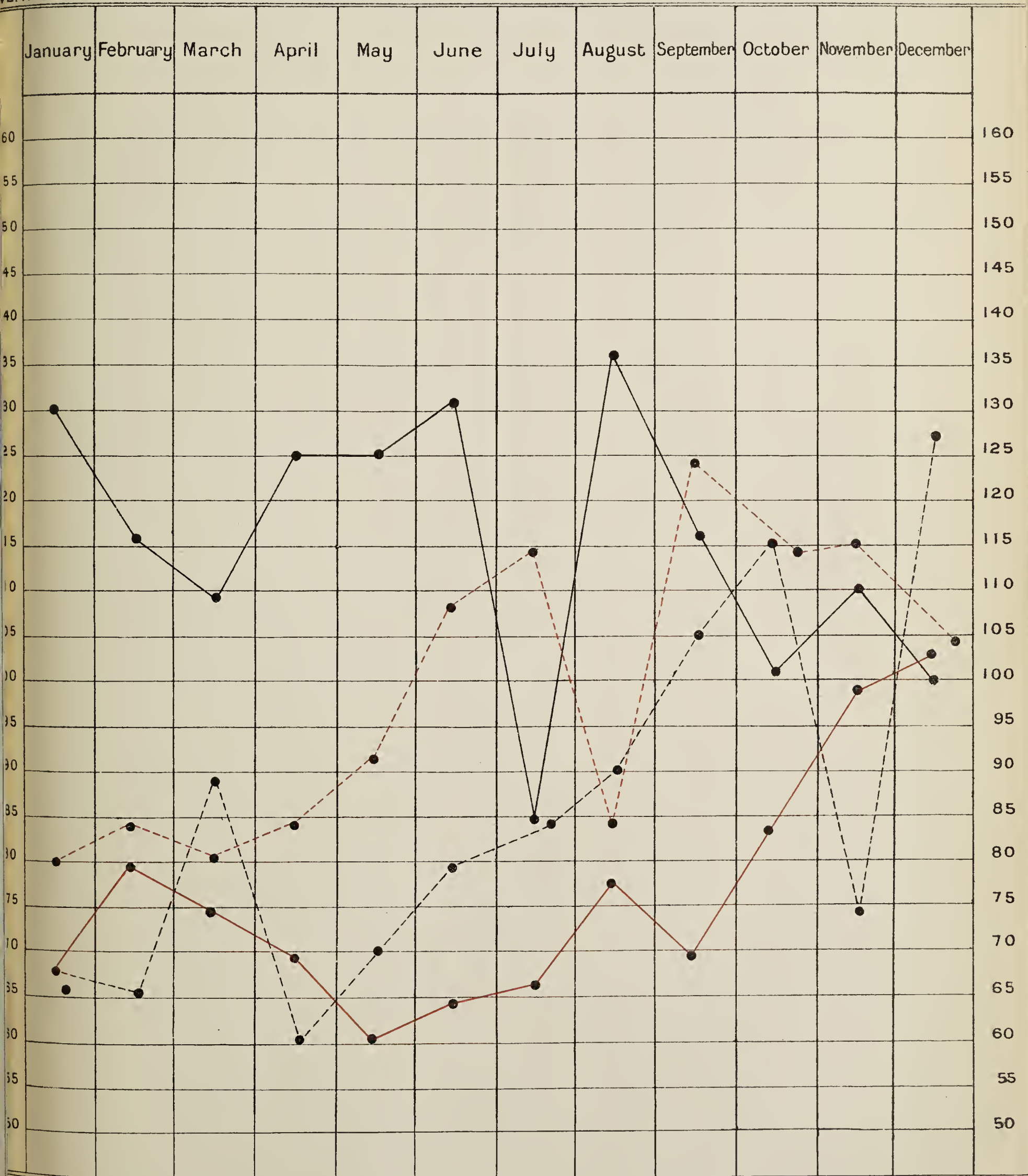




Chart. D.

CHART SHOWING ADMISSIONS OF EUROPEANS (ALL DISEASES) BY MONTHS 1909 TO 1912 INCLUSIVE

VERTICAL LINES REPRESENT MONTHS - HORIZONTAL LINES REPRESENT NUMBERS, IN FIVE TO A LINE.



Black line shows admissions 1909

Red line shows admissions 1911

Dotted black line shows admissions 1910

Dotted red line shows admissions 1912



